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Translation Pedagogy in the Digital Age

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1. Growth of the global translation market

- 1 The global translation market has experienced sustained growth over the last few decades, and although actual estimates of the growth rate may differ between sources (Kelly et al. 2010; Drugan 2013; DePalma et al. 2014; Pym 2016), the trend finds confirmation in research reports, anecdotal evidence and official forecasts issued by professional organisations.
- 2 Between the years 1950 and 2004 the language service provision (LSP) market grew at the average annual rate of 5% (Drugan 2013). In the light of Kelly et al.'s (2010) research results, in 2010 the market was worth 26 billion USD. More recently, in the years 2013-2015, the annual growth averaged 6.46%, as reported by the Common Sense Advisory (CSA) (DePalma et al. 2017), an independent, Massachusetts-based consulting firm specialising in language services, whose research results demonstrate the global language service market to have generated revenue at the level of 34.8 billion USD in 2013, nearly 37.2 in 2014 and 38.2 in 2015. The most recent data from CSA (DePalma et al. 2017) reveal a further growth in revenue from 40 billion USD in 2016 (DePalma et al. 2016) to 43 in 2017 (DePalma et al. 2017).
- 3 By Pym's (2016) seemingly bold estimate, the current growth rate is even greater and could be as high as 10% annually, which dovetails with the predictions for the years 2008-2015, published as part of a study report on the size of the language industry in Europe commissioned by the Directorate-General for Translation of the European Commission (DGT 2009). According to the study data, the industry's value in Europe amounted to 8.4 billion EUR in 2009 and was predicted to reach a minimum of 16.5 billion EUR by 2015.

- 4 The LSP industry's growth is reflected not only in revenue figures but also in the number of jobs generated by it. For instance, the US Bureau of Labor Statistics (US BLS 2015) predicted a colossal increase of 46% in the number of jobs available within the LSP industry in the years 2012-2022. Its latest forecasts predict a 17% growth in employment between 2016 and 2026, with the average growth rate for all other occupations amounting to only 7% (US BLS 2017).
- 5 The growth has been stimulated by a number of factors, including globalisation and increased migration flows. As Orlando (2016) posits, due to the voluntary and non-voluntary "circulation of people, goods, services, ideas and cultures" (Orlando 2016: 18), which has resulted from the internationalisation of the economy or conflicts and natural disasters respectively, demand for professional language service provision has visibly increased. Following Cronin (2003), he also points towards people's increased social agency, i.e. involvement in intergovernmental and nongovernmental organisations operating worldwide to resolve problems relating to nature conservation, climatic change or renewable energy, as a catalyst for international communication and thus the implementation of translation and interpreting.

2. Shifts in professional practices

2.1 Work modes and tools

- 6 All this has exerted a significant influence on the professional practices of the LSP industry, which — amongst the manifold consequences of increased demand — needs to face rapidly growing volumes of text (Lionbridge 2017) to be translated in a relatively short time and at a low cost (Choudhury & McConnell, 2013). In response to that, language service provision must involve technologies which permit the automation of the translation process (TAUS, 2013), the use of Computer Assisted Translation (CAT) tools (Bondarenko 2015; US BLS 2017) as well as the harnessing of telecollaborative translation work modes (Pym 2016; Schaeffner 2016), which permit commissions to be job-shared by translation teams, thus reducing the time in which they can be completed. Interestingly enough, team translation is by no means a sign of the times. As Bistué (2013) demonstrates, collaborative translation practices were already used in medieval and Renaissance Europe, when translators would either work in teams while transposing voluminous texts from Greek, Arabic and Hebrew into Latin by delegating specific tasks to selected individuals, or when they would collaborate with copyists and printers in an attempt to produce multilingual translations in a range of layouts. The novelty of today lies in the electronic tools thanks to which team translation can now be performed, i.e. state-of-the-art translation technologies, including locally installed CATs (Bondarenko 2015), cloud-based Software-as-a-Service (SaaS) solutions (Mrochen 2014) and Web-enhanced communication tools.
- 7 Due to the introduction of a range of translation technologies, the profession has undergone serious change. As Orlando (2016) rightly observes, the relatively safe 20th-century pattern of professional translators working in-house within the structures of larger companies has been replaced with the 21st century's much more volatile reality, where self-employed, freelancing individuals perform specific tasks for translation agencies, get commissioned to perform jobs directly by their clients, and where they must cope with worldwide competition. As Beens (2017) explains, more and more

freelance translators face competition from larger translation bureaus — many of them expanded through mergers and acquisitions — thus they need to join colleagues, form teams and perform translation jobs via telecollaboration. Just as the practical conditions of the translator's work change, so does the mindset of translators need to alter in order to permit them to embrace greater flexibility, increased social interaction.

- 8 Online technologies have not only internationalised translation, permitting all the stakeholders to operate from locations all over the world, but they have also freed translators from the burden of having to work in a fixed setting, e.g. the translation bureau, with a predetermined set of tools, frequently limited to the locally available software, and at a fixed time, e.g. during office hours. LSPs can now basically work on an anytime/anywhere basis, at the time of their choice, from the location they deem most convenient — be it at home, away from it or even while travelling — and with the use of a platform they find most suitable.
- 9 One of the outcomes of this is the translator's increased online presence, which requires the development and use of a number of ICT (Information and Communications Technology) and online communication skills. For example, as O'Brien (2012) posits, the translator of today utilises Web-based solutions in order to interact with clients or co-translators. Email and instant messaging have, to a large extent, replaced telephones and faxes, while CD-ROMs — and other portable storage media — which were once used to deliver the source text to the translator, have now been replaced by workflow management tools, through which texts can be downloaded. More recently, file sharing services and cloud-based disks, operating as server spaces administered by users at their discretion, have also been used for that purpose.
- 10 In the course of translation project work, communication between all the stakeholders involved in it is also largely performed online, with Web conferencing software and webinars being utilised for team meetings and training sessions respectively (O'Brien 2012), and Enterprise Resource Planning (ERP) tools helping translators handle the commercial and financial aspects of translation projects (Foedisch 2017).
- 11 It is interesting to see how the Web has rapidly transformed from a collaboration and communication platform only to increasingly being the source text itself. That is to say, the content featured on Computer-Mediated Communication (CMC) websites serves as the text to be translated. As Desjardins (2011) demonstrates, it is particularly visible in the localisation industry, where translators are more and more frequently commissioned to translate advertising campaigns delivered by means of social media, including social networking sites, such as Facebook or Twitter. She rightly observes that while translators may use social media for professional practices, thanks to the experience they gain, over time they also become better prepared to translate content distributed through that channel.

2.2 Skills and job requirements

- 12 In order to be able to cope with this exponential increase in work modes, translators have to learn how to deal with an ever-changing, dynamic market reality. Consequently, they need to develop not only trade-related hard skills, but also a set of soft skills, or employability skills, which will permit them to act flexibly and respond to the circumstances of various professional contexts in which they are likely to find

themselves. The skills may include: communication and media skills, teamwork skills, interpersonal skills, cultural awareness, flexibility, critical thinking skills or leadership skills (Schultz 2008; Bartel 2011; Mathias 2013). This idea finds corroboration in the expectations of LSPs towards university graduates who enter the job market, as reported e.g. by Brookes (2017), the professional development officer for the Institute of Translation and Interpreting, who affirms that LSPs require freelancers to display a degree of flexibility, availability and an understanding of how they fit into the translation process. In addition, she underlines that one of the prerequisites for success in the contemporary translation market is preparedness for life-long learning and the ability to plan their continuous professional development.

- 13 In the same vein, Claudia Mirza (2017), CEO of Akorbi — one of the fastest growing LSPs in the world and a member of the Globalization and Localization Association, lists strong critical thinking skills, communication skills, problem-solving skills and collaboration skills among those she finds most necessary for translators of the future.
- 14 It is all well illustrated by what is happening to the translation process in the wake of ubiquitous digitalisation. Increased interest in speedy delivery, even if it is achieved at the cost of quality, has spawned interest in the implementation of Machine Translation (MT), which requires translators to perform post-editing jobs rather than simply translating texts (Beens 2017). However frustrating it may be for translators at times, it is a fact now and it calls for them to develop new skills (Brookes 2017).
- 15 Similarly, localization, which involves the translation of digital content — e.g. computer games, websites or online services — for an area-specific audience, requires a new set of skills which are much closer in origin to the domain of computer programming than to translation (Brookes 2017). After all, in order to translate computer games, mobile applications or websites, the translator needs to identify and access translatable content first, which without a knowledge of programming, they will find challenging as well as time consuming.

3. Rooting pedagogic adaptation in emergentist theories

- 16 In the wake of the above, it seems reasonable to suggest that if translators are to be equipped with the aforementioned skills, they need to be educated within the framework of a new methodology, one that would break away with the transmissionist model of teaching and direct students towards teacher-independent learning and informed reflection.
- 17 An answer to the apparent need for closing the employability gap (Massey 2017) — also referred to as the skills gap (Brookes 2017) — seems to be offered by emergentist epistemology, which has been promoted as a solution for translator education by Kiraly (2006; 2013; 2015). It relies on a number of theories, including Whitehead's (1950) process theory, Davis' complexity theory (Davis and Stimmt 2003) and van Lier's (1996; 2000) ecological approach to language and language acquisition, with each making an important contribution to the theory at large. The process theory posits that the world is in a state of constant, dynamic development, thus it is difficult to draw a universally true picture of it which would be a valid reflection of reality. The complexity theory, which might be viewed as a possible reinterpretation of postmodernist thought (cf.

Cilliers 1998), underlines the belief that knowledge is not a body of static, objectivised and transmittable truths, but rather a complex entity which emerges out of experience, constantly in flux and developing through fractal, self-similar and multifaceted experiences. Finally, the ecological approach to translation, inspired by van Lier (2000), puts the translation process in an environmental context, which goes beyond the source/target text and the cognitive processes which translation involves. It views translation as a situated event, affected by complex interactions between the actors involved in it as well as the physical objects used in its course.

- 18 When brought together, the three approaches constitute a translation pedagogy which places the student at the centre of the learning process, in the middle of the experience gathered through participation in authentic, or near authentic, telecollaborative translation projects where the teacher only *occasions* (Kiraly 2015) — rather than transmits — knowledge, which emerges in the course of the experience itself.
- 19 It must be underlined that learning outcomes in this case exceed declarative knowledge *per se* and extend to cover skills and awareness, which Kiraly (2013) perceives as a synergic product of a complex interplay of corporeal, personal and interpersonal dispositions, human and material resources, learning results and intuitions as well as memories. It is this multifarious bundle of interrelated traits which Kiraly labels “emergent competence” (Kiraly 2013: 11) — impossible to predict, situated (Risku 2014) and developed through interaction with others. To do justice to the emergentist approach, one must note that it also relies on Kiraly’s (2000) social-constructivist approach, which builds on Vygotsky’s (1978/1994; 1986) concept of the social construction of knowledge but also Dewey’s (1938) concept of learning through action.
- 20 While Vygotsky emphasised the social nature of learning by claiming that “The true direction of the development of thinking is not from the individual to the social, but from the social to the individual” (Vygotsky 1986: 36), Dewey underlined the discovery of knowledge promoted by the learner’s hands-on learning experience, maintaining that: “[An individual] [...] has to see on his own behalf and in his own way the relations between means and methods employed and results achieved. Nobody else can see for him, and he can’t see just by being ‘told’” (Dewey 2008: 57).

3.1 Web-based pedagogies

- 21 Just as computer and Web-based technologies have affected the translation profession, so is telecollaboration, as a learning mode, likely to have an impact on how learners interact with one another, how they communicate and ultimately — how they learn. To realise the nature of this impact, it seems reasonable to articulate the cognitive and affective aspects of telecollaborative work modes and their material dimension, i.e. the digital technologies and tools utilised within them. In other words, it is necessary to examine the ecology of telecollaboration, its material context, in the same way as the materiality of translation has been examined in recent research in Translation Studies (cf. Desjardins 2011; Ehrensberger-Dow et al. 2015; Littau 2015).
- 22 As Desjardins (2011) demonstrates, the development of the Web, from Web 1.0 to Web 3.0 technology, has apparently coincided with shifts in pedagogy, as the new functionalities offered by the technologies being introduced permitted educators and learners to design and perform, respectively, different types of learning tasks.

- 23 The evolution of the Web first began with the introduction of Web-based services, commonly referred to as Web 1.0, which first and foremost created opportunities for the reception of information published on read-only websites. As the Web at that time relied on pre-digested content, it very much generated one-way online traffic in that Web users were limited in their actions to mostly searching and consulting data which were presented to them on the websites that they visited (Berners-Lee 1989). Due to its nature, when Web 1.0 technology was implemented in educational contexts, it produced a learning model biased towards content reception, whereby learners acted as passive knowledge recipients. In many ways, the content provided online through Web 1.0 technologies paralleled content which might equally have been presented offline (Prensky 2001), which usually happened in non-Web-based settings. This is why Bax (2003) referred to the Web 1.0-based developmental stage of Computer Assisted Language Learning (CALL) as the restrictive phase.
- 24 The resultant learning epitomised the transmissionist paradigm, within which students acted as “containers for content (knowledge)” (Klimkowski 2015: 82), and learning occurred through the teacher-centred transfer of largely declarative knowledge, including rules, facts and principles, to be assimilated by the learners.
- 25 In translation pedagogy, that kind of learning has to this day been part of the *who-takes-the-next-sentence* approach (Nord, 1996), which “thwarts student’s development of cognitive and metacognitive skills relating to translation/interpreting” (Klimkowski 2015: 85).
- 26 The introduction of Web 2.0 marked a shift in (translation) pedagogy as, contrary to its read-only Web 1.0 predecessor, it was fundamentally a read-write Web (Dale Doherty 2004). Consequently, by permitting users not only to consult but also produce content, it promoted Web-based human-human interaction, which resulted in the development of methodologies within which students changed their role from that of passive knowledge recipients to that of active learners who would attempt to construct knowledge actively through social interaction. In addition, learners would no longer simply consult online content, but they would exercise *telepresence*, by congregating and collaborating online. The potential of the Web to foster communication generated opportunities for online social networking, e.g. the use of Facebook for educational purposes, which in Desjardins’ (2011) words, transformed learning into a form of socialising. As she reports, social networking empowers the teacher to mark his/her presence online, but it could also have a positive impact on the students’ perception of the teacher, thus bringing the teacher closer to the learners offline too. Interestingly enough, online presence on Facebook does not necessarily place the teacher in control of course content dissemination, as the platform’s interface equally permits all the participants of a virtual group to upload their own content (Desjardins 2011).
- 27 Thanks to the affordances of Web 2.0, the transmissionist paradigm was replaced by the social-constructivist model of education, based on the ideas of Vygotsky (1974/1994), Wood et al. (1976), Bruner (1996) and Dewey (1916; 1938). Social-constructivist learning would rely on the concept of the community of practice, where learners could learn by interacting with others via synchronous (instant messaging) and asynchronous (online forums, wikis, social networking sites, or discussion groups) communication modes (Desjardins 2011). Learning became a social experience, collaborative in nature, and occurring in a setting where teacher and learner roles were much more balanced, with the teacher acting as a guide supporting the learning process, and the learners actively

involved in the construction of knowledge. Thanks to social networking, learning could occur through peer-to-peer sharing, and the teaching content was diversified by the introduction of media-rich content (Desjardins 2011). This kind of learning is currently referred to as *peeragogy* (Corneli et al. 2016) — a distinct form of pedagogy which involves peer-to-peer learning, self-directed learning, as well as diffused and decentred leadership and assessment.

- 28 In translation pedagogy, this kind of learning found endorsement in the writings of Kiraly (2000), Nord (2005) and Gonz  les-Davies (2005; 2017), who all advocate collaborative translation projects as a means by which to develop a range of translation competences. As Desjardins (2011) demonstrates, these competences may be updated to cover a range of collaborative and digitised practices relating to modern-day translation, e.g. the localisation of digital media, including social networking sites and video games or the translation of online marketing campaigns.
- 29 Web 3.0, referred to as the semantic Web (Berners-Lee 1989), converged digital resources and services in order to permit the customisation of content in congruence with the user's needs. As Jenkins (2006) explains, the convergence of the Web, which enabled online applications — both desktop and mobile — to integrate and interoperate, has contributed to a further shift in pedagogy, this time towards the development of cross-disciplinary skills and higher-order skills (Bloom and Krathwohl 1956), e.g. critical thinking, synthesis or metacognitive skills. What is more, it promotes complex learning, which involves the convergence of skills (Weller 2007) and dovetails with Kiraly's (2013; 2015) emergentist approach to translator education, where students participate in authentic translation projects in the course of which they are given the opportunity to develop complex translation skills while delivering a translation product to a genuine client.
- 30 In emergentist pedagogy, knowledge is a complex adaptive system which emerges "through the translator's embodied involvement (*habitus*) in actual translation experiences" (Kiraly 2013: 203), students are active knowledge seekers, while the teacher's role is to *occasion* translator competence, which is a situated outcome of the dynamic interplay of human and material resources, personal, interpersonal and psycho-physical dispositions (Kiraly 2015). Within the emergentist approach, the teacher is no longer an expert to deliver the final word, but rather a learning partner — a co-learner.
- 31 This kind of pedagogy can potentially facilitate learning in various contexts, e.g. foreign language learning (Kiraly and Signer 2017), but it has also been used in order to enhance translator education. Within the latter field, it consists in the implementation of collaborative translation projects, which have been administered and researched by Kiraly (2013; 2015), Kiraly and Hoffman (2016), Massey (2017) or Marczak (2017a; 2017b), where student teams perform translation jobs, frequently for a genuine client, while using online translation and communication technologies. As a result, they are given the opportunity to perform in various roles, explore translation through practice and co-learn by benefiting from their colleagues' knowledge, skills and experience.
- 32 Marczak and Krajka (2016) and Marczak (2016) investigated the potential of Web-based team translation projects, involving the use of social media, e.g. social networking sites, file-sharing services and online communicators, for developing a range of skills in translation students. In one of the projects, groups of students teleworked in order to compile a term bank containing entries relating to the area of Computer Assisted

Translation by using a range of online tools, including *Facebook Messenger*, *TitanPad*, *Google Live Docs*. The project work involved Web-based searches for reference texts, parallel text alignment, term extraction with CAT tools (*memoQ* or *PlusTools*), data collection, database creation with CAT tools, and data transfer to a printable format through the *Mail Merge* functionality of *Microsoft Word*. The telecollaboration stage was preceded by face-to-face instruction in: Language for Special Purposes (LSP), the role of terminology in translation, terminology management and CAT/terminology tools.

- 33 As the results of the post-project survey indicated, student satisfaction levels with the telecollaborative experience were high, with 100% of the participants reporting learning gains from participation in the project examined. Large proportions of students observed the project they had completed had been an opportunity for them to explore the nature of teamwork and participate in it and learn how to use Computer-Mediated Communication (CMC) tools and CAT tools. However, they had also reportedly had a chance to develop time management skills, emotion regulation skills, stress management skills, interpersonal skills and self-awareness, i.e. a number of transferable/soft skills.
- 34 In another project (Marczak 2017a; 2017b), students telecollaborated in order to deliver the translation of a number of chapters from a book on hortitherapy, whereby they practised the use of cloud-based technology for the purpose of LSP translation. This example demonstrated novel forms of reflection, such as concordancer-enhanced reflection on in-project communication data, which may even further enrich students' learning in telecollaborative settings with regard to the development of operational, cultural and critical literacies, as well as employability skills. What is more, such reflection enables students to look beyond their own communicative exchanges and into those of their colleagues, whereby they extend their project experience to the roles which they themselves have not been directly involved in. Vicarious as such extended experience may be, it is likely to build students' increased awareness of a broader range of responsibilities, work modes, actions and problems which are potentially part and parcel of Web-based team translation.
- 35 Emergentist translator education may rely on the use of social media to an even greater extent. Thanks to the ubiquitous nature of social networking sites and their common use, they increasingly constitute both the source text and *modus operandi* in contemporary translation. Desjardins (2011) suggests that they be used for projects where student translators get involved in "translating 'tweets', and 'status updates', uploading YouTube videos for newer translation technologies [...] and participating in what came to be known as the 'translation classroom community'" (Desjardins 2011: 186).
- 36 This is an idea worth following, as it does not limit the learning experience merely to translation *per se*. Instead, it permits students to explore social media as a working environment, develop marketing skills, e.g. by designing "promotional Facebook pages for fictional translation companies" (Desjardins 2011: 186) or identify and explore the latest translation technologies. What is more, it all happens in a deeply democratised setting, where students not only find it easier to relate to their colleagues and the teacher thanks to the instantaneousness of the communication tools which they use, but where they also become more open in interactions with their colleagues. In addition, social media offer students an equal chance to receive learning content as well as to provide it themselves, which enables them to initiate learning, rather than

only following the teacher. Finally, students' increased confidence in social media may start to use it for the purpose of self-development at large, e.g. foreign language learning, which broadens their overall educational experience (Desjardins 2011). In some cases, social media may be the tool through which learning extends to contexts beyond institutionalised translator training as students can easily set up, run and participate in domain-specific learning communities even before they become full-fledged professionals; thus they give themselves a chance to genuinely experience the benefits of social learning as well appreciating the role of networking in professional development (Desjardins 2011; 2017).

3.2 Utilisation of CAT tools

- 37 Apart from the use of a range of online technologies, be it communication or learning solutions, technology-enhanced translator education also — if not first and foremost — involves the use of CAT tools and other digital resources, e.g. Machine Translation, which have had a profound impact on the work modes which translation students — as well as professional translators, for that matter — implement. That kind of impact has also generated interest among Translation Studies researchers (O'Brien 2007; 2012; Pym 2011; Koglin 2015; Law 2015; Bungaard et al. 2016).
- 38 As Pym (2011) observed, technology constitutes an extension of the physical apparatus through which people interact with the world around them. It extends the human limbs (e.g. the arms), the senses (e.g. sight, hearing and touch), and people's capacity to travel and interact with other cultures. Although he means technology in a very broad sense, he further narrows his interest to the impact of computer technology on the translation process *per se* and concludes that effects in the latter case are undeniable and multiple in nature.
- 39 First of all, computer technology externalises the translator's memory in that the translator can make use of: computer-stored translation memories, featuring previously translated segments of text; termbases, i.e. inventories of domain-specific terminology; MT systems, which handle the translation of texts on behalf of the translator in an automated manner; or quick-access online documentation. In principle, all the digital resources are supposed to accelerate — and thus assist — the translation process; however, it is often the case that they may actually have the opposite effect, thwarting the translator's decision-making process by offering a list of multiple alternatives for the translator to choose from (Pym 2011).
- 40 Pym (2011) also observes that the digitisation of translation breaks with the Saussurean syntagmatic axis of text, i.e. its linearity. Electronic texts can now be read vertically — in chunks, segments or with attention focused on lists of items offered by the spellchecker — rather than horizontally, i.e. from the beginning to the end, as has traditionally been the case. Due to the use of hypertext for website design, or the segmentation of the source text in CAT tools or MT systems, translators increasingly follow what Saussure referred to as the paradigmatic axis of language. In effect, they may easily lose track of the overall cohesion of the text. It is particularly likely to interfere with translation if the translator is making use of integrated technologies, such as translation memories, MT services, grammar and spell checkers as well as glossaries. Automatically, they tend to focus on the terminological or phraseological

consistency based on a segment-by-segment analysis of the target text but, in effect, lose sight of the syntagmatic integrity of the text.

- 41 While student translators and in-service translators start using modern CAT tools, which involve online technologies, they immediately shift the nature of their work from a considerably solitary activity to one involving telecollaboration, where responsibility does not lie solely with them but is
shared by a synchronic/networked project manager, coordinated team of translators/localizers, computer engineers, computer programmers, software developers, software engineers, localization engineers, terminologists, graphic designers, software publishers, localization vendors and so forth (Odactoglu and Kokturk 2015: 1089)
- 42 What is more, as Pym (2011) observes, the digital nature of texts to be translated and the automation of translation also diversify the roles that student translators and professionals themselves need to adopt. Due to the volumes of text to be translated, the range of text formats, their multimodality and multimedia character, translation, and translator education as a result, necessitates project management, product engineering, marketing skills (Pym 2011), but also Web design, computer programming and social media skills (Desjardins 2017). Machine translation, in turn, requires human post-editing.
- 43 All this may change translators' and translation students' perceptions of who they actually are and how they fit into the translation process, which may constitute a real challenge (O'Brien 2012; Brooks 2017). Due to the fact that these roles do not necessarily involve translation *per se*, translators are likely to feel that they no longer translate. For instance, as Brooks (2017) posits, translation students may have a feeling that LSPs have unrealistic expectations towards them with regard to the skills they should be equipped with, while those involved in post-editing could be under the impression that their professional status is being "demoted to the status of a fixer" (O'Brien 2012: 10), who does not even understand the mechanics of MT, is incapable of collaborating with the machine and may begin to distrust the technology in the long run. Post-editing may be perceived as a proofreading job, lacking in opportunities for creativity and generating low satisfaction levels. At the same time, the apparent demotion of translation could be at least in part redeemed by new challenges which translators face today, including the need to involve in marketing, social media management or cultural consulting.
- 44 In effect, translator education seems to require a revision of the long-standing theories of translation taught so far, e.g. the Skopos Theory, so that they are updated with elements pertaining to computerised translation; only then will students of translation fully understand their place in the reality of digital translation, the tools they will need to use and the nature of the source and target texts they will have to work on (Odactoglu and Kokturk 2015).

4. Future outlook

- 45 Apparently, the future is likely to hold even more change and innovation for stakeholders involved in education at large, including translator education. As the translation market and Web and translation technologies will continue to change under the influence of automation and innovation, so will — inevitably — translator

education, whose primary task will be to prepare students for the imminent changes to come on the job market. Closing the skills gap is already a recurrent theme in the discourse on the future of translation (Brookes 2017; TAUS 2017), and so it will motivate the development of the objectives, work modes and tools in translator education.

- 46 Increasing computerisation and automation, achieved through machine learning (TAUS 2017), will require students to act flexibly and develop the ability to skill and re-skill on demand, so that they can identify and fit into the professional niches where they will be able to function while working together *with* computers as well as *for* computers. According to TAUS (2017) predictions for the year 2022, in certain areas of the economy, computers will replace humans completely by reaching the level of sophistication at which they will be able to work with one another without the mediation of the human being at all.
- 47 Consequently, the job market is likely to become an even more volatile place than today. While Frey and Osbourne (2013) estimate at the level of nearly 40 percent (38%) the capacity of the job of translators and interpreters to lend itself to computerisation, in the case of other translation-related jobs they cite much higher values, e.g. the probability index for proofreading is 84% and that for technical writing amounts to 89%.
- 48 One should not take these figures as a case of scaremongering, nor should one simply believe in an inverse correlation between the rate of automation and employment. After all, automation means the re-structuring of the job market, rather than its liquidation, which finds confirmation in Pring's (2017) prediction that although roughly 19 million people in the USA will face the automation of their jobs, 21 million new jobs will be created in the wake of that process. For instance, as machine translation might replace translators in transposing and updating domain-specific, fairly repetitive texts, at the same time it requires human post-editing. Thus, although it seemingly replaces the translator, it in fact simply requires the translator to perform a different job, which may indeed require high qualifications. De Faria Pires (2017) and Di Lorenzo and Cattelan (2018) confirm this by admitting that due to the largely improved fluency of output generated by contemporary neural machine translation systems, e.g. Deep L, the post-editor must be a highly skilled professional who will be capable of identifying and correcting errors obscured by the seemingly high quality of the machine-translated text.
- 49 To respond to these changes and prepare students for highly specialised LSP jobs, completely new tools and further automation of the translation process, translator education will need to continue to implement student-focused work modes through which students will be able to learn how to independently seek, validate and update knowledge far beyond the point of graduation. Education is certain to take advantage of the affordances created by ever-evolving digital technologies, which can be illustrated by the development path predicted for Web-based resources.
- 50 As Aghaei et al. (2012) posit, Web 4.0 is around the corner, and it will be "a read-write-execution-concurrency web with intelligent interactions [...] a symbiotic web in which human mind and machines can interact in symbiosis" (Aghaei 2012: 2). Just as applications and services have already undergone the process of convergence under the development of Web 3.0, so are the processing powers of the human mind and the machine, i.e. the computer, expected to converge in the case on Web 4.0. Online

interfaces will reach a higher degree of sophistication as they will not only be controlled by the human mind but — thanks to artificial intelligence — they will also interact in an intelligent manner with humans (Aghaei 2012). However vague the concept of Web 4.0 may sound, it seems to fit in perfectly with the latest trends in translation and translation technologies, which are beginning to increasingly rely on digital resources involving artificial intelligence, neural machine translation technologies, deep learning and voice-based solutions (Lionbridge 2017).

- 51 If Web 4.0 is to act as webOS, a near-human intelligent operating system, capable of sophisticated interactions with humans (Aghaei 2012), one may predict that (translator) education is about to shift towards the implementation of learning modes which will involve not only human-human interaction but also seamless human-computer interaction. The learning outcomes will, perhaps, be produced by the synergy effect of computer and human processing/mental powers, where learners will be learning through, and together with, computers, just as today they are expected to explore and construct knowledge together with peers and the teacher. The learning tool may become a learning partner.
- 52 Consequently, if Kiraly's (2013) perception of translator competence as context-based and surfacing in a particular *translatory moment* is correct, it may be speculated that, perhaps — as a result of Web-4.0-based learning — the competence will emerge as an interplay of not only human and material resources, memories, students' personal and interpersonal dispositions, psycho-corporeal dispositions and learning results and intuitions, but — possibly — also the memories and learning results of the computer itself. What is more, this interplay might additionally involve artificial intuition, which might be developed in the course of further work on the development of artificial intelligence (see Perez 2017; 2018).
- 53 Overall, the evolution of computer technology may have increasingly been democratising the learning process, with the teacher relinquishing more and more control to the students, and the students integrating more and more with the converged technologies available to them on a daily basis; and this could be the path education will follow in the years to come.

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ABSTRACTS

The language service provision industry is rapidly developing, with the market growing on an annual basis (Drugan 2014; DePalma et al. 2014; 2017; Pym 2016) due to voluntary and non-voluntary human mobility, increased social agency (Cronin 2013), as well as the worldwide provision of services, goods and cultures (Orlando 2016). As a result, the practices of modern-day language service providers are being altered via the implementation of Machine Translation (MT) (TAUS 2013) and Computer Assisted Translation (CAT) tools (Bondarenko 2015) so that the industry can cope with increased volumes of text to be translated, shrinking deadlines, and decreasing remuneration (Choudhury & McConnell 2013). At the same time, the translation market is becoming convergent as language service providers expand, while freelancers attempt to retain a competitive edge by teaming up (Breen 2017). Whatever the case, online solutions are being implemented which permit translation teams to work flexibly via telecollaboration (Pym 2016; Schaeffner 2016). The sign of the times is the need to keep abreast of the shifts in work modes and tools necessitated by them, which requires translators to display a set of skills relating to both translation technologies and telecollaboration and communication tools (Bondarenko 2015). What it brings to the forefront of contemporary translator education — and also language education, for that matter — is the learner's capacity and preparedness for self-directed, autonomous learning (Kukulska-Hulme et al. 2015). Having said that, today's translator education systems must create conditions for students not only to learn about translation but also develop a range of soft/employability skills, e.g. critical thinking skills, communication skills, problem-solving skills and collaboration skills, which will help them live up to the expectations of the Language Service Providers (LSPs), or the market at large (Mirza 2017). This paper investigates how translator education may respond to that need through a pedagogic shift from traditional, positivist epistemology, consisting in teacher-centered instruction and knowledge transmission, towards emergentist education, which emancipates the learner, situates the learning experience, emphasizes collaboration and aims at developing translator competence, which is viewed as a complex system of interactions between a myriad of context-dependent factors (Göpferich 2008; Kiraly 2013; 2015; Kiraly and Hoffman 2016). The author examines how this new pedagogy affects the learner, their self-perception and conceptualization of the translation profession, with particular emphasis on Web- and CAT-based pedagogies and work-modes. It concludes with a number of evidenced predictions which altogether constitute a voice in the debate about the future outlook for translator education.

Le secteur des services linguistiques est en pleine expansion et son marché croît année après année (Drugan 2014; DePalma et al. 2014; 2017; Pym 2016): cette croissance est nourrie par les mobilités humaines (choisies ou imposées), l'essor des activités sociales (Cronin 2013), et la circulation mondiale des services, des biens et des cultures (Orlando 2016). Afin de pouvoir gérer des volumes sans cesse croissants de textes à traduire, des délais toujours plus courts et des prix toujours plus serrés (Choudhury & McConnell, 2013), le modèle opératoire des prestataires de services linguistiques fait une part toujours plus belle à la traduction automatique (TAUS 2013) et aux outils de traduction assistée par ordinateurs (Bondarenko 2015). On observe une

convergence du marché de la traduction, avec l'extension de la taille des prestataires de services linguistiques et la création d'équipes de traducteurs indépendants qui cherchent ainsi à rester compétitifs (Breen 2017). Dans tous les cas, les traducteurs se tournent vers des solutions en ligne qui leur permettent de travailler de manière flexible par le biais de télécollaborations (Pym 2016; Schaeffner 2016). L'évolution des modes de travail et des outils afférents requiert des traducteurs qu'ils se maintiennent à niveau et qu'ils mobilisent un éventail de compétences liées aux technologies de traduction, ainsi qu'aux outils de télécollaboration and communication (Bondarenko 2015). La formation des traducteurs d'aujourd'hui (et de manière générale des linguistes) doit aussi évoluer et préparer l'apprenant à envisager une formation continue, autonome et auto-déterminée (Kukulska-Hulme et al. 2015). Les programmes de formation en traduction doivent créer les conditions pour que les étudiants, outre le savoir-faire du traducteur, acquièrent un savoir-être professionnel, incluant notamment l'esprit critique, la communication, la résolution de problème et la collaboration, qui leur permettront de répondre aux attentes des prestataires de services linguistiques (LSPs), ou du marché en général (Mirza 2017). Cet article tentera de montrer l'intérêt pour les formations en traduction d'effectuer une révolution copernicienne en délaissant l'épistémologie traditionnelle et positiviste, où l'instruction et la transmission du savoir sont centrées sur la figure de l'enseignant, pour un modèle pédagogique émergentiste, qui vise à émanciper l'apprenant, situer l'expérience d'apprentissage, valoriser la collaboration et développer la compétence du traducteur, définie comme un système complexe d'interactions entre de multiples facteurs contextuels (Göpferich 2008; Kiraly 2013; 2015; Kiraly and Hoffman 2016). Nous examinerons les effets de cette nouvelle pédagogie sur les apprenants, leur perception de soi et leur théorisation du métier de traduction, en portant une attention toute particulière aux pédagogies et modes de travail numériques. Pour conclure, nous contribuerons au débat sur le futur de la formation des traductions en proposant plusieurs pistes étayées par les faits.

INDEX

Keywords: Language Service Providers LSP, translation, technology, digital translation pedagogy, telecollaboration

Mots-clés: prestataires de services linguistiques LSP, traduction, technologie, pédagogie numérique, télécollaboration

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