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Toward a new profile for twenty-first century language specialists: Industry, institutional and academic insights

UPSKILLS Intellectual output 1.2

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Executive Summary

The extraordinary achievements of artificial intelligence are impacting all sectors of society and raising issues that concern, among others, what emerging skills are needed by the world of work, how amplification of the current gender gap can be limited, and whether disruption can be an engine for positive change. These issues affect the language and linguistics sectors strongly, and should be carefully considered by higher education degrees in setting their priorities so as to favour employability, job retention and job satisfaction for the coming years.

Language industry surveys conducted in the past decade have identified several essential competencies and roles required of new graduates beyond the obvious ones (concerned with languages, linguistics, translation and terminology). The most prominent among them are related to service provision (project management, client relations, quality control), marketing and copyediting (local storytelling, creative content creation, transcreation) and technology (translation memory tools, post-editing of machine translation, file format conversion, handling of mark-up languages, software and web localization, data analysis, data cleaning, training and evaluation of MT systems, written and spoken language resource creation, information gathering, automatic creation, processing and analysis of multilingual content, written and spoken language analysis and synthesis).

Institutional reflection has pointed to a global societal need to focus more on transversal skills such as the ability to access and process information critically, team work, digital data literacy, understanding of AI and entrepreneurship. These skills should be nurtured in all graduates, to guarantee that they are resilient and can adapt to rapid changes throughout their careers. Concerning language degrees in particular, it is suggested that they should cultivate cultural agility and research skills in their students, which would allow them to target alternative career paths, thus increasing their appeal for prospective students and employers. Translation degrees may have less of a “branding” problem, but they also need to revamp their priorities by targeting a growing range of language services, and familiarizing their students with AI-powered machine translation and translation into the L2.

Lastly, scholarly reflection has pointed to the need for technology teaching in higher education to be embedded in professional workflows that require and develop creativity, research skills and data literacy. A concrete methodological proposal in this sense is that of research-based curricula. In this approach, enquiry-based activities are devised in which students collaborate in teams toward a research goal, with substantial space for tailored, self-directed learning and the possibility to make mistakes in a protected environment.

List of abbreviations

Abbreviation	Definition
AI	Artificial Intelligence
ELC	European Language Council
ELIA	European Language Industry Association
EMT	European Master's in Translation
LIS	Language Industry Survey
OPTIMALE	Optimising professional translator training in a multilingual Europe
STEM	Science, Technology, Engineering, Mathematics
TAUS	Translation Automation User Society
WEF	World Economic Forum

1. Introduction

Job markets are known to change quickly, as do the professional profiles and required skills of those who end up being hired. For instance, it is estimated that 47% of **jobs** in the United States are currently **at high risk of being lost to computerization** (Frey and Osborne, 2017). The jobs that are the most likely to be taken over by machines are those that are **amenable to routinization**, while “occupations that involve complex perception and manipulation tasks, creative intelligence tasks, and social intelligence tasks are unlikely to be substituted by computer capital over the next decade or two” (ibid: 262). Among the language-related professions included in the report, teacher jobs do not seem to be highly endangered in this respect, but translator and interpreter jobs are considered medium risk occupations, occupying position 265 in a list of 702 professions ranked from the least to the most computerizable.

At the same time, several **skills** are **rising to prominence** for employers. According to the World Economic Forum report, emerging skills such as **critical thinking and analysis, problem solving, self-management, active learning, resilience, stress tolerance and flexibility** are more important than ever (WEF, 2020). However, these are often not explicitly targeted by higher education degrees. Similarly, **gender issues** cannot be overlooked. It has been repeatedly pointed out that the fourth industrial revolution will impact men and women differently. “[A]ccording to the WEF *Future of Jobs Survey*, assuming that the current gender gap ratios persist through the 2020 period, for men there will be approximately one new STEM job per four jobs lost, but for women, for every single new STEM job created, 20 jobs will be lost” (Gleason, 2018: 8). At the same time, disruptions caused by **fast technological change may offer opportunities** to break away from the status quo (ibid).

Against this background, it seems essential that higher education institutions training language specialists continuously assess whether the skills they impart to their students are the ones that they need to succeed in their future careers, and re-evaluate the ways in which these skills can be best developed. This report offers an overview of industry insights, institutional recommendations, and scholarly reflections concerning critical skills needed by 21st century students in general, and by language, linguistics and translation students in particular. It focuses on new challenges related to fast technological and societal changes, and the ways in which they are likely to impact **employability, job retention and job satisfaction**, particularly (though not exclusively) in market sectors hiring **language and linguistics graduates**. To this effect, three main types of partly overlapping sources are examined, namely industry surveys, institutional position papers, and academic works by scholars from languages/linguistics and education studies.

2. Language industry perspectives

In recent years, several surveys promoted and funded by institutions (particularly the European Union) and by industry associations have tapped into the needs and views of the actors involved in language service provision.¹

In the framework of the Lifelong learning project OPTIMALE (Optimising professional translator training in a multilingual Europe), an employer survey and consultation was carried out in 2011 with 738 language service providers based in 27 countries (Rothwell and Svoboda, 2012). Leaving aside the obvious need for core language and translation competencies, the OPTIMALE survey identifies **project management and client relation competencies** as essential; in particular the ability to identify client requirements, to produce estimates, to lead complex projects, to identify the resources needed and to define and apply quality control procedures. In terms of technology, the only competencies considered essential or important by the majority of respondents are those related to the use of **translation memory tools**. Yet, all other IT-related skills mentioned in the survey, which include post-editing of machine translation, file format conversion, handling of mark-up languages as well as software and web localization, were deemed important or essential by at least 20% of respondents, reflecting the growth of “technology-oriented” companies.

Two reports from the TAUS language technology think-tank (<https://www.taus.net/>) were published in 2016 and 2017 surveying the translation technology sector: the TAUS Translation Technology Landscape Report (Massardo et al., 2016) and the TAUS Machine Translation Market Report (Joscelyne et al., 2017). While neither targets skills directly, they describe several industrial trends relevant for educational purposes, based on an extensive survey of over 100 companies altogether. Massardo et al. (2016) point out that translation, like most other business sectors, is undergoing a process of datafication, whereby the **ability to analyse different kinds of data** is becoming fundamental in optimizing the translation process. They expect that “[t]ranslation companies will be looking out for data specialists who can help mine data and develop the algorithms that automate and optimize management processes” (ibid: 80). Focusing specifically on the machine translation sector, Joscelyne et al. (2017) register a growing number of companies offering consulting and customization services including data cleaning, training and evaluation of MT systems. They expect the biggest gains in this sector to derive from “collect[ing], curat[ing] and clean[ing] the best possible training data for their own domains, products, content types and usages”. At the same time, they raise the alarm concerning the availability of relevant specialist skills: “[t]ranslation operators that want to build up their own MT expert team internally will find it relatively hard to find the

¹ In this report we use the term *language specialists* to refer to professionals offering language services of different kinds, thus not distinguishing between experts in modern languages, linguistics and translation. This seems to be coherent with the perception of the surveyed industry sector (see e.g. Joscelyne, 2018: 8 and Vintar et al., 2017: 3).

appropriate skills in the labor market as **computational linguists and MT experts are a rare breed**” (ibid: 38).

Notwithstanding the importance of data specialists, both reports point out that the sector also needs language and linguistics competencies. In particular, there is a need for language experts with competencies in terminology and semantics who can contribute to the improvement of Neural MT systems (Joscelyne et al., 2017: 41), and of linguists with an **understanding of digital marketing techniques and locales**, who are able to “deliver tailored experiences that drive increased usage through increased local relevancy” (Massardo et al., 2016: 85). Joscelyne et al. (2017: 37) further point out that ubiquitous low-quality machine translation is likely to lead to attempts to differentiate one’s brand or service via high-quality translation. A growing demand is expected for services such as “hyper-localization, transcreation, personalization or content recreation”, which involve **technical skills, cultural awareness and creativity**. Finally, Massardo et al. (2016) stress the “repeatedly reported” problems connected to recruitment of adequate human resources and predict that “prices for basic translation services are and will keep plummeting, while those for ancillary services will become more remunerative due to the lower availability of adequately skilled resources” (ibid: 86).²

Taking stock of the trends just described, the briefing based on the 2018 TAUS Industry Leaders Forum, titled “Translators in the Algorithmic Age” (Joscelyne, 2018) describes the roles and skills that are likely to become ever more prominent in the future: transcreation, spoken language resource creation, conversational system training and quality evaluation, and the roles of brand ambassadors and local storytellers. Knowledge of specific **languages and cultures**, combined with **digital skills, creativity and flexibility** are thus suggested to be key in redefining the role of language specialists in the digital age.

The European association of language service companies (ELIA) has published reports in 2019 and 2020 covering expectations and concerns of the language industry in Europe. The Language Industry Survey 2019 and 2020 (henceforth LIS19 and LIS20), the latest in a series that started in 2013, address language service providers (LSPs), freelancers, buyers, training providers and translation departments from Europe and beyond, reporting the views of around 1,000 respondents and observing trends throughout the years.

Concerning the skill levels of new graduates entering the market, writing skills in the native language, foreign language skills and translation skills score the highest according to translation companies surveyed in LIS19, while generic IT skills, translation technology skills and information gathering and processing skills score the lowest (LIS19: 27). These views are largely confirmed by LIS20: the only skills of master graduates deemed sufficient by those who hire them are writing skills, translation competence and foreign language skills; the **lowest**

² To offer a clearer view of the range of ancillary services connected to translation, both reports include a large number of detailed industry profiles (more than 80 translation technology companies and around 30 machine translation providers). In the words of Massardo et al. (2016: 5), these offer “a comprehensive overview of the many creative ways in which translation technologies are currently being used”.

scoring skills are those concerning **market expectations, planning and quality processes, and, once again, translation technology** (LIS20: 56).

In terms of future trends, language companies are consistently very positive about technology developments, particularly as concerns machine translation, process automation and, in LIS20, artificial intelligence. From LIS19 to LIS20 a noticeable change in the perception of language professionals has occurred with reference to machine translation and post-editing. In LIS19 machine translation was seen as the second biggest challenge after price pressure, with less than 10% of freelancers expecting an increase in demand for machine translation and post-editing (LIS19: 36-37). In LIS20, on the other hand, only about a third of professionals were still concerned about MT, while almost 50% expected an increase in demand, leading to **machine translation and post-editing being considered the strongest positive trend** by all respondent categories (LIS20: 67, 72).

On a side note, LIS19 also takes the gender dimension into account for the first time, highlighting a predominance of women among freelancers, academics and training staff (though not among language service providers), and a substantial revenue gap in favour of men. In other words, **the bulk of the workforce in the language industry is largely female, but the more profitable, higher-ranking jobs are still held mainly by men.**

Two last surveys are worth mentioning, that carried out as part of Erasmus+ projects, rather than resulting from industry initiatives: the KA2 Strategic Partnership project DigiLing (TransEuropean e-Learning Hub for Digital Linguistics), and the Erasmus+ capacity building project CLASS.

The companies targeted by the DigiLing survey in 2017 (81 companies, based in 8 countries) provide a complementary perspective to the ones reviewed above, being less concerned with language service provision in the traditional sense, and more with other industry sectors hiring linguists, such as Technology, Entertainment and media, and Communications. Consequently, competencies are also partly different. Alongside translation (both human and automatic), the need of which is expected to increase in future years, respondents report the need for **sorting, analyzing and categorizing multilingual documents** and emails by content, and the need for the **automatic creation or processing of multilingual content**, in particular for terminology consistency checks. More sophisticated IT tasks such as email and voice response generation are reported as being still of marginal import (Vintar et al., 2017: 14-16).

Finally, the Erasmus+ capacity building project CLASS reports company survey results related specifically to computational linguistics. The team of the CLASS project (Development of the Interdisciplinary Master's Program in Computational Linguistics at the Universities of Central Asia) interviewed over 50 companies and found that in this sector the most valued general skills were **creativity and critical thinking**, while the most desired specific competencies included **basic knowledge of text analysis and synthesis, the ability to apply existing resources for development and the ability to construct new resources** such as text corpora (Abdurakhmonova et al., 2020).

3. Institutional views

3.1 Overall outlook for education

Having illustrated the take of the world of work on new competencies needed by language and linguistics students, in this section we take stock of institutional reflection. In particular, we focus on position statements, recommendations and competence models by international institutions and by academics, often pooling together under the aegis of the said institutions, to innovate higher education programmes.

In answering the question “What education do we need for the 21st century?”, the 2015 UNESCO report *Rethinking education* reflects on the skills and competencies required in an increasingly complex and uncertain world, where scientific and technological development make it almost impossible to predict what professions will emerge. Faced with this uncertainty, the skill singled out as perhaps the most important of all is “the **ability to access and critically process information**” (UNESCO, 2015: 41). To nurture this skill, education should centre around the **co-creation (rather than transmission) of knowledge** “used for developing basic language and communication skills; for solving problems; and to develop higher-order skills such as logical thinking, analyzing, synthesizing, inferring, deducting, inducting, and thinking hypothetically” (ibid). These skills, along with **team work, digital literacy and entrepreneurship** will ensure that individuals are more resilient and can adapt more effectively to the rapidly changing needs typical of our times. Hence, the term “twenty-first century skills” (ibid: 60).

Focusing on the relationship between education and Artificial Intelligence, the OECD *Future of Education and Skills 2030* report aims to answer the question of “what it means to be intelligent in an AI augmented world” (OECD, 2018: 5). Since routine tasks are likely to be taken over by intelligent machines, students need **competencies that allow them to approach and solve complex problems in innovative ways**. The report lists critical thinking, problem solving, creativity, communication and collaboration among the competencies associated with twenty-first century skills (ibid: 7). Furthermore, a general basic **understanding of AI** is needed if people are to engage effectively and critically with intelligent machines. Yet the report does not limit digital literacy to an understanding of information technology. More generally, special attention should be devoted to **data literacy**, which describes “the ability to collect, manage, evaluate, and apply data, in a critical manner” (Ridsdale et al., 2015 in OECD 2018: 14).

3.2 Institutional perspectives for the language sector

Within the language sector, one of the most hard-hit by the changes just discussed, reflection is underway on how curricula should change to answer the societal challenges affecting

students. These reflections mirror closely the emphasis that institutions concerned with education at large place on twenty-first century skills. Already in 2013, the European Language Council (ELC) Report on *The future of language degrees* (Kelly, 2013) pointed out that research was needed to establish the needs of the language sector, and what expertise and contribution language graduates should be expected to provide. Several suggestions were made to **language degree decision makers** about ways to cope with the challenges while taking advantage of opportunities. These include making provisions for **greater flexibility** to accommodate societal changes, targeting **career paths alternative to standard vocational options** such as language teaching, placing greater attention on skills and competencies that make language graduates an asset to a range of professions, such as **cultural agility and research skills**, and finding solutions to the “**branding problem**” of language degrees, or the “mounting difficulties in selling themselves in what is an increasingly competitive market [...] due to a lack of broad appeal to a target audience that includes not only prospective students but also employers” (Kelly, 2013: 8).

At the same time, a number of institutional initiatives targeting translation and interpreting competencies have been conducted in recent years.³ The most influential of these is probably the updated European Master’s in Translation (EMT) network competence framework (2017). The 2017 version of the EMT competence framework draws attention to a set of factors that the field cannot afford to ignore: the **growing range of language services** which translators and translation companies can provide, the greater need for **translation into one’s second language** as a result of the continuing expansion of English as a lingua franca, and the impact of technological changes such as the generalized **availability of AI-powered machine translation** applications. The latter in particular is “impacting the translation process and many translation markets, and has changed the **perception of translation among the general public** and among translation studies students and graduates” (EMT, 2017: 2). This is both an opportunity, as more people than ever are aware of and engage with translation thanks to technology, and a challenge, since professionals feel under threat due to competition from non-professionals and machines.

4. Scholarly reflection

4.1 Digital challenges and digital opportunities

Proposals have been made to counteract the challenges identified by the EMT. Niztke et al. (2019) report the views and findings of the DigiLing Erasmus+ partnership. They suggest that,

³ Several other researchers and research teams have worked on defining translation competencies, most notably the PACTE group (Hurtado Albir, 2017) and the Erasmus+ eTransFair project (<https://etransfair.eu/>).

to dispel fears of being replaced by computers, language specialists need “proficiency in a variety of tools, the ability to quickly grasp new developments, and the capability to adapt and respond accordingly” (ibid: 293). Their list of generic digital competencies includes: information and data literacy, the ability to critically evaluate digital information, to find and communicate information, to share digital contents, and to use digital communication and collaboration platforms (ibid: 294). This **versatility in dealing with technology** is best achieved thanks to **blended learning**, which allows educators to select contents according to their needs, students to learn at their own pace, and professionals to efficiently combine their work life with crucial life-long learning to keep abreast of emerging technology and related skills.

A very recent position paper by scholars from six higher education institutions from across Europe lists what they perceive as emerging roles for professional translators. These include: becoming an advocate for **multilingualism as a globalization tool**; **managing large-scale global initiatives** that require translation and transcreation; bringing **linguistic knowledge to interdisciplinary teams** of developers and service providers to design and adapt AI systems to the needs of new registers, styles and languages; **evaluating AI technologies**; **approving and vouchsafing** the correctness of automatic translations (Bernardini et al., 2020: 301-302). The authors conclude that, to prepare for these emerging roles, “responding to change with more and more specific technological know-how alone is futile. Instead, general skills and knowledge domains need to be identified which provide a basis for continuous developments throughout a lifetime” (ibid: 302). These views and practices would seem to be gaining ground within Master’s degrees educating translators: based on surveys conducted by the EMT network in 2012 and 2017 (Rothwell and Svoboda, 2019), **activities through which technology is embedded in research projects and professional workflows** show an upward trend with respect to the simple practice of individual tools.

4.2 Educational insights: Research-based teaching

The focus on twenty-first century skills is coherent with socio-constructive educational models that view learning as an active process of enquiry on the part of students, such as **task- and project-based learning**. Fung (2017: 20) describes one such model, in which students engage in research tasks: “the predominant mode of student learning on contemporary degree programmes should reflect the kinds of active, critical and analytic enquiry undertaken by researchers”. A **research-based curriculum** can take advantage of the current **ease of access to information and data** that technology provides, involving students in **collaborative, real-world enquiry**. Research-oriented skills with high employability potential thus focused upon relate to ways of approaching research design (the ability to review a problem, identify a solution and imagine new opportunities), research methods (project management, leadership

and teamwork) and research data (social skills for data collection, critical thinking, and communication/dissemination) (Naseem and Fleming, 2018).

There are several advantages to a research-based curriculum. First, **enquiry-based activities increase student engagement** and result in knowledge that is more readily applicable to real tasks (ibid: 37). Second, **collaborating in teams toward a research goal** provides experience of the kind of activity that more and more students will be confronted with in the workplace, “where the meaning of skills will become more of interpreting rapidly changing information and being able to work with experts and stakeholders” (Penprase, 2018: 225). Third, space for **tailored, self-directed learning** is made available early on in a degree, and may lead to better informed choices of dissertation topics in the students’ final year (Saw, 2018: 66). Fourth, while working in a safe environment, **students are allowed to make mistakes** and learn “how mistakes are intrinsic to research and knowledge acquisition”, often leading to groundbreaking serendipitous findings (Peters and Shephard, 2018: 117).

5. Summing up

Combining insights from industry surveys, institutional position statements and academic reflections, the present report highlights that there are substantial and growing job opportunities for graduates with competencies in technology (particularly data analysis) and linguistics/languages. Several skill clusters emerge as important for twenty-first century students of language and linguistics, to be employable in the digital market sector:

1. **Disciplinary “core” knowledge** (competent use of language(s), linguistic analysis skills, translation, terminology and semantics-related competencies)
2. **(Inter)cultural awareness** (awareness of cultural differences, a thorough understanding of the local context, ability to localize and personalize content accordingly)
3. **Interpersonal and entrepreneurial skills** (communication skills, teamwork, marketing skills, evaluating client and market expectations, planning skills, project management, quality control skills)
4. **Technical skills** - basic (generic IT skills, handling text in different formats, handling specialised software such as CAT tools), and advanced (process automation, familiarity with AI developments)
5. **Data skills** (ability to collect, manage, curate, clean and analyze different kinds of language data)
6. **Research skills** (critical processing of information, research design, problem solving, logical thinking, hypothetical thinking, creative and innovative thinking, evaluating technologies)

The skills from the first two clusters are typically seen as already being at a satisfactory level, at least in translation and modern language degrees, with room for improvement for aspects such as terminology handling or the ability to transcreate. The emphasis on **entrepreneurial and interpersonal skills** is at least partly due to the fact that industry surveys mostly target the language service provision sector, but many of the skills that fall under this cluster are in fact relevant more generally and are often cited as also being **research-oriented (e.g. project management and teamwork)**. The technical cluster is the one that tends to worry language professionals most, being subject to the most rapid changes and being perceived as the most distant from the traditional humanities perspective on language; however, this cluster has received a lot of attention and all stakeholders appear to be aware of the need to act upon it (and are already doing so). The last two clusters, on the other hand, seem to have attracted less attention in the domain of language and linguistics degrees, while at the same time being the most important ones to address, based on input from employers, institutions and academics. Looking from a wider perspective of changing societies and fluctuating job markets, **data skills and research skills appear to be the ones that can open up most opportunities**, and are thus perceived as key for addressing the challenges posed to twenty-first century education, jointly with the closely related issue of **research-oriented teaching**, as the best method in pursuit of such skills.

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