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Paper:

Rothwell, A. & Svoboda, T. (2019). Tracking Translator Training in Tools and Technologies: Findings of the EMT
Survey 2017. *Journal of Specialised Translation, 32*, 26-60.

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Tracking translator training in tools and technologies: findings of the EMT survey 2017

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ABSTRACT

Over the past quarter century, translation tools and technologies have become indispensable in the language industries, and therefore also in university programmes that train student linguists for entry into them. The two Competence Frameworks set out by the European Master's in Translation (EMT) Network (Gambier (ed.) 2009, Toudic and Krause (eds) 2017) each devote a major section to Technological Competences, and delivering them effectively to students is a key criterion for admission to the Network. In 2012, for the EU-funded OPTIMALE project, the present authors surveyed 50 European postgraduate translator training programmes to investigate which technological competences they were delivering and how they were doing so. In 2017 the EMT Network decided to update and re-run the 2012 survey, to track the evolution of this aspect of translator training over the intervening five-year period. This article reports the results of this latest survey and compares them with those of its predecessor, revealing a clear trend towards greater uptake and professionalisation of tools and technologies training. While it is not possible to ascribe such positive developments solely to the EMT, it is probable that the Network has had a beneficial impact, both by strengthening relations between industry and academia, and by facilitating the exchange of good practices among programmes.

KEYWORDS

Translation technology, translation technology teaching in university settings, machine translation, CAT tools, cloud, post-editing, EMT.

1. Introduction

Relevant literature, our own observations, and consultations suggest that translation practice has become increasingly technology driven and technology dependent. Whereas some ten or fifteen years ago, much mention was made about a change in translation reality as well as the newness of technology in the translation process (some even referred to a "technological revolution" — Olvera Lobo *et al*. 2007, similarly in Pym 2013 and others), translation technology seems to be taken for granted nowadays. In fact, this situation has given rise to the meme of the so-called technological turn in Translation Studies (Chan 2002, Zhang and Cai 2015). In developed markets, virtually no translations are produced without the help of computers and technology. In specialised/technical translation, Computer Assisted Translation (CAT) tools (considered in the narrower sense of the term) form an indispensable part of the translation process itself in many current implementations.

In addition, market intelligence tells us that it is a competitive advantage for translators in their daily translation practice to master not one or two, but probably three or more software tools. The choice of tools is linked to clients' preferences, which may include the following: The Human-Computer Interaction (HCI, in terms of user-friendliness, i.e. how easy/difficult it is to operate the software functionalities), licencing policies (free of charge vs. paid-for), features (e.g. sub-segment matching, advanced terminology management, Artificial Intelligence [AI]-enabled functionalities), extensions (machine translation [MT] engines supported, APIs to corpus management systems) and interoperability potential. Put bluntly, different clients and jobs require different tools and some tools come with features, which others tend to lack. By combining the outstanding features from a pool of tools[1], translators can harvest all the potential of individual (and still quite different) tools and, ultimately, become winners in this technology race in specialised translation practice.

The present study focuses on university courses and curricula at Master's level aimed at regular students, particularly those programmes that are members of the European Master's in Translation (EMT) Network[2]. Sponsored by the European Commission's Directorate-General for Translation (DGT), EMT was initiated in 2009 as a forum to bring together Europe's best Master's-level translator training courses and accelerate the dissemination of good practice (European Commission n.d.). To be admitted, universities must demonstrate that their training delivers key professional competences to their students, central among which is the understanding and effective use of computerised translation tools and technologies, the so-called technology competence. According to the EMT Competence Framework (Toudic and Krause (eds) 2017: 9), the technology competence includes the following:

> [...] all the knowledge and skills used to implement present and future translation technologies within the translation process, [...] basic knowledge of machine translation technologies and the ability to implement machine translation according to potential needs.

This area of competence is broken down into six actual skills: (i) using IT applications and the ability to adapt to new tools and IT resources, (ii) using search engines, corpus-based tools, CAT tools, etc., (iii) pre-processing, processing and managing files and other sources within the translation process, (iv) mastering the basics of MT and understanding its impacts, (v) assessing the relevance of MT in translation workflows and being able to implement MT where relevant, (vi) applying supporting tools related to translation technology, such as workflow management applications (Toudic and Krause (eds) 2017: 9).

An important EMT spin-off project was the OPTIMALE (Optimising Professional Translator Training in a Multilingual Europe) Erasmus Academic Network, led by Université de Rennes 2, which was active from 2010 to 2013. Involving 70 partners from 32 different European countries, OPTIMALE aimed to monitor developments in the translation professions and how students were being trained for them (OPTIMALE 2013). The project's Work Package 5 conducted an online survey of the training in tools and technologies provided by MA programmes across Europe, the results of which were reported by Rothwell and Svoboda (2012).

The current (2014-2019) EMT Network members decided that it would be valuable to re-run the OPTIMALE survey (referred to below as OPT2012) every five years, in order to track new developments and trends. Accordingly, a new version of the online survey (referred to below as EMT2017) was created, using the same general structure but with some additional questions to address known shifts in the technological environment (Rothwell and Svoboda 2017a). Composed using Google Forms, EMT2017 was open by invitation between May and September 2017 (original deadline extended from June). Preliminary results were presented on 21 November 2017 at the EMT Network meeting in Dublin City University. The present article reports the key findings of EMT2017 and identifies the main developments and trends since OPT2012. Further details, particularly the interesting full-text comments contributed by respondents, may be found in the anonymised dataset of responses (Rothwell and Svoboda 2017b).

2. Literature Review

The role technology plays in translator training has been debated broadly for decades now. In the early 1990s, there were some initial mentions of technology use in translation courses (Winkler 1992, Scherf 1991, Decesaris 1996). As an early example, Leeds University's MA in Applied Translation Studies, launched in 1996 by Andrew Rothwell and Mark Shuttleworth, contained from the start a compulsory CAT module which at first taught only IBM Translation Manager 2 (with major input from Robert Clark, IBM's Leeds-based UK representative for the tool), before adding in its second iteration an early version of Trados Translator's Workbench and MultiTerm. Such instances bear witness to interesting, yet still somewhat isolated attempts by individual lecturers, rather than systemic approaches and organic components of translation curricula. In 1996, Schäler made a plea for the introduction of translation technology teaching into standard translator training programmes (Schäler 1998, cf. Williams and Chesterman 2002: 16).

Ultimately, this gradual development and its reflection in the area of Translation Studies and/or translation pedagogy as well as, perhaps, a

response to the above-mentioned plea, is documented by a number of articles that describe the introduction of translation technology teaching (i.e. of IT tools or, specifically, of CAT/MT) into a translation curriculum (Kenny 1999, Kenny and Way 2001, Austermühl 2013, Alotaibi 2014, Šanca 2017 and a number of others)[3]. Typically, they list market relevance and, ultimately, their graduates' employability as their motives for establishing the course. At the same time, many approaches and specificities can be found representing variations of such courses on tools, such as approaches integrating corpora. Various methods tend to be presented, such as blended learning and collaborative projects; the latter, as a popular means to integrate tools teaching into translator training, have been implemented in a number of translation institutes and described in the literature (e.g. Shuttleworth 2017 with further literature references, Clark *et al.* 2002). Apart from teaching specialised software to students, one should not forget the general IT skills that (future) translation practitioners need (cf. e.g. Fulford and Granell-Zafra 2005: 13).

On a more generic note in terms of translation tools teaching, Dorothy Kenny (1999), apart from a substantial overview of relevant literature from the last decades of the 20th century, presents a section on "Translation Memory and Translation Pedagogy". Williams and Chesterman (2002) outline the topic of "The Place of Technology in Translator Training" in their methodological guide, while the *Routledge Encyclopedia of Translation Technology* devotes a whole chapter to "Computer-aided translation: Translator training" (Bowker 2015). Unlike a decade ago or so, now there seems to be a well-established corpus of literature sources for the topic of teaching/training translation tools and technology in classroom settings; these resources now add up to several dozen[4].

As witnessed by numerous publications (Kourouni 2016, Lakić and Pralas 2016, Thelen 2016, Shuttleworth 2017 and others), the EMT competence framework (Gambier (ed.) 2009 and Toudic and Krause (eds) 2017) has been an influential model on which to build or fine-tune translation curricula in many areas and ways. In the technology domain Shuttleworth, for example, explicitly states that "it is on ideas such as [the EMT competence framework] that the modules' curriculum and approach are broadly based" (Shuttleworth 2017: 20)[5].

Most of the literature sources concerning the topic of teaching translation technology — both those listed here and others — seem to echo in unison the observation that translation practice and the translation market are undergoing a profound change towards more — and more intense — automation. They agree that technology changes the way translators (and localisers) work and they list the impacts this shift is likely to have on the

translation profession (cf. Svoboda 2014, Svoboda 2017, for example) and localisation practice (Pym *et al.* (eds) 2006).

Although many of the observations in related literature are certainly accurate and a number of the prognoses in the older literature have materialised recently, the impression arises that the evolution of the market reality is both gradual and homogeneous. However, the situation is much more complex. There is no such thing as "the" translation market, which means that, overall, the market landscape is very diverse: not only from one country to another, but also within national markets. Looking at Europe, for example, based on our own experience and observations involving the UK, Czech Republic, Slovakia, Austria and the Netherlands, the uptake, proliferation, and implementation of technology in the translation process (or, more broadly, communication or content creation/management process) varies greatly. From the resilient practice of assignments being e-mailed, then processed and prepared/pre-treated manually, to dedicated project management interfaces or AI-powered project management modules embedded in CAT suites; through to translation process disintermediation, which is in the making, with semi-automated translation bureaus involving a handful of staff and a dynamic base of clients, translators and reviewers, all of whom are interconnected in a kind of private social network. All this means that, when designing a translation technology curriculum, one needs to abandon the idea of a homogeneous translation market; rather it is necessary to consider the local and international specificities and, potentially, adapt the curriculum accordingly (for additional aspects of such diversity, cf. Lakić and Pralas 2016).

Clearly, this notion of change covers a temporal/evolution aspect. As curriculum developers will have witnessed, such progress is unstoppable. As soon as they have succeeded in designing and implementing a course in technology, some have already seen themselves in need of updating/upgrading their translation technology courses[6] a few years on – cf. (Moorkens 2018), or the following observation by Shuttleworth (2017: 34):

> [C]urricula are constantly needing to evolve and courseware to be updated from one year to the next not only to reflect the latest software versions but to allow for the introduction of new tools whenever this seems to be called for.

Consequently, many of the literature items suggest and, eventually, posit as a constitutional element, that present-day developments in translation technology be reflected by training institutes (Gaspari *et al.* 2015, Odacıoglu and Kokturk 2015 and many others). The good news is, as witnessed by our present research, that this is exactly what they do (i.e. the training programmes represented in the survey under scrutiny here). There has also been a call for MT post editing (MTPE) and MT engine tuning to be incorporated into translator training (Mellinger 2017) — another aspect of tools teaching,

which, according to our recent survey among EMT member institutes, has moved from a niche feature to an increasingly represented component of study programmes. All in all, the temporal aspect is a distinctive feature of the present study. In this respect, instructive comparisons emerge in the discussion below between the results of two surveys, five years apart.

3. EMT2017 Survey Results

As mentioned in the Introduction, this research stems from findings of the OPTIMALE 2012 survey (OPT2012) and the EMT Network re-run of the online survey in 2017 (EMT2017). In 2012, the EMT Network comprised 34 members, expanded to 62 by 2017. OPT2012 received 50 responses, 23 from programmes that were members of both EMT and OPTIMALE, 6 from EMT-only and 17 from OPTIMALE-only members, with 4 respondents, which were members of neither network. EMT2017 received 55 responses, 45 from Network members and 10 from institutions outside the EMT. 17 institutions (i.e. approximately one third of each respondent group) completed both the 2012 and the 2017 survey. Each survey received responses from around three quarters of EMT member programmes at the time, which was perhaps to be expected given the prominence of the technology competence in the Network membership criteria.

Both surveys carry one significant 'health warning': as in 2012, it may well be that programmes (both in and outside the EMT) that regarded themselves as more "advanced" in this area were more likely to respond. Therefore, the picture of training emerging from the survey almost certainly represents the practice of a substantial avant-garde, rather than an average across all programmes. To ensure comparability it has been necessary in some cases to convert 2012 results, shown for ease of comparison in [square brackets], from percentages to raw numbers. Unlike OPT2012, EMT2017 was constructed so that completion of all the box-ticking questions was mandatory in order to progress, which ensures a consistent number of responses (55). Many of the free-text questions that followed them were however optional, so where answers to these are discussed (below), the number of respondents will be given. Each of the sub-headings that follow below corresponds to a section of the survey.

3.1 Master's Programme Details

Section 1 of the survey captured programme demographics, which have remained broadly stable.

Q1.6 (ECTS value) showed that a large majority of programmes are 120 ECTS in size. One institution reported both 120 and 90 ECTS variants, while three offered both 90 and 60 variants (Figure 1):
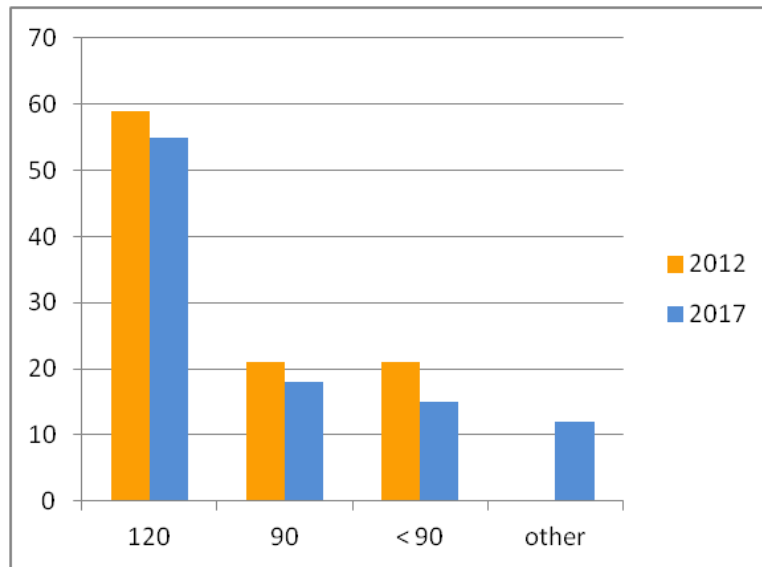
Figure 1. ECTS values (%)

Q1.8 (launch year) confirmed the major expansion in programmes this century, with 52% [60%] founded between 2000 and 2010; only two programmes had been launched since OPT2012 (in 2013 and 2016).

Q1.9 (student numbers) confirmed that around a third of programmes remain very large (over 60 students: indeed, 20% had more than 100), whereas in the middle ground, size has apparently shifted somewhat down towards the 20-40 range (Figure 2):
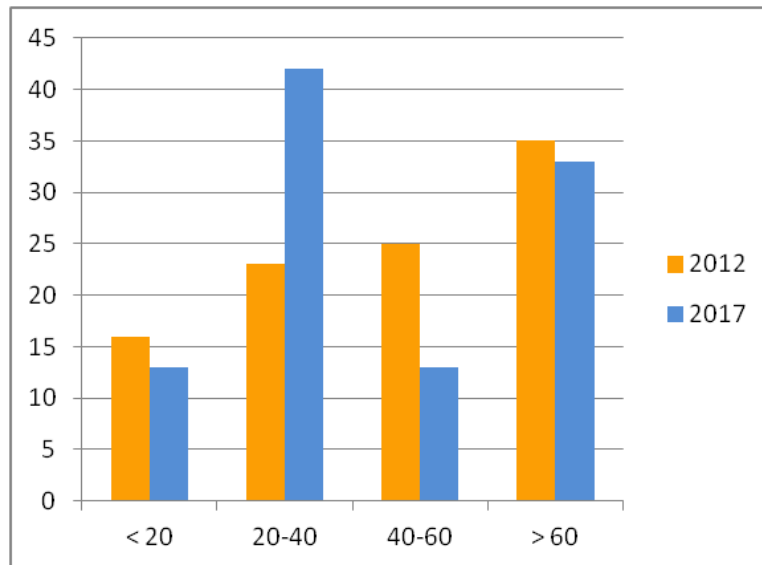
Figure 2. Student numbers (%)

This again raises interesting questions of scale in relation to hands-on experience with tools, project work, staffing (parallel teaching sessions), etc., always easier to provide with smaller student numbers.

3.2 Approach to Tools Teaching

Section 2 of the survey aimed to establish the broad philosophy of tools and technologies training within MA programmes.

Q2.1 confirmed that 100% of respondent programmes taught the theory and practice of tools, against [93%] in 2012. More significant was the estimated proportion of learning time given over to tools (*Q2.1 – Q2.9*): in 2012, only [7%] of programmes devoted more than 25% of their time to tools, whereas in 2017 half of programmes allowed more than 25% of tools content, and 9% of programmes allowed more than 50% (Figure 3):
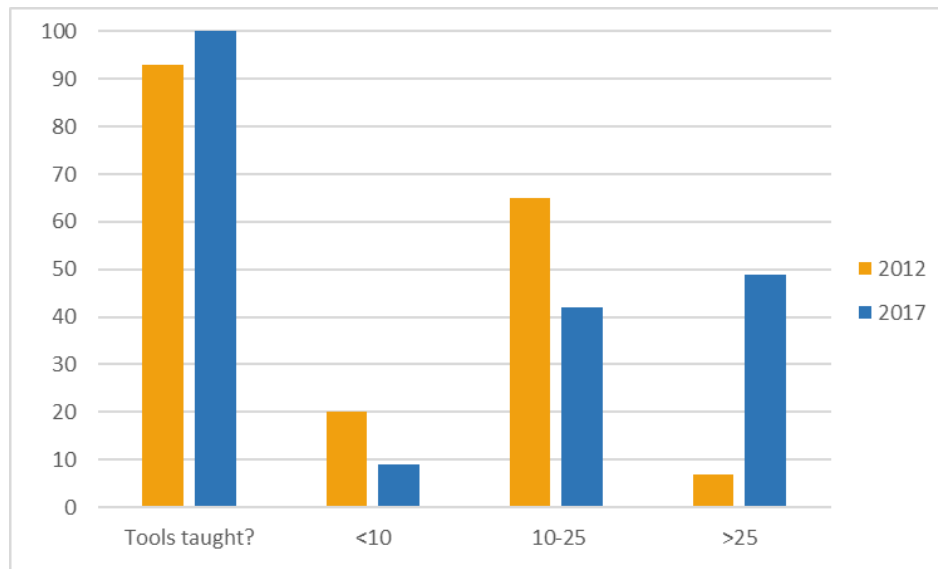
Figure 3. Maximum study time devoted to tools (%)

Moreover, descriptions of compulsory elements of curricula suggest that tools are now more closely integrated with practical translation, and in some cases professional development modules. The 5 respondents to *Q2.5* explained that the range of tools-related options, and/or the possibility of writing a dissertation about tools, led to cases where the total tools content could exceed 50%. *Q2.7* (47 responses) gives a useful listing of compulsory modules on different programmes, which vary quite widely in subject, number and size. *Q2.9* (40 responses) provides a similar list of optional modules covering a very broad range of topics.

In response to *Q2.10 (approach to tools training)*, 89% [79%] of programmes reported that they taught cost-free tools and 98% [82%] commercial tools. One programme explained in *Q2.11 (statement of tools training strategy)* that a decision had been taken to use only free, generic tools. While all programmes in both surveys taught tools-use from the translator's perspective, there had been a dramatic increase in teaching from the perspective of the project manager (84%, up from [49%]) and a significant rise in the use of multilingual projects (91%, up from [68%]), though only a minority taught tools from a language services provider (LSP) perspective and that percentage had declined slightly (42%, down from [47%]) (Figure 4):
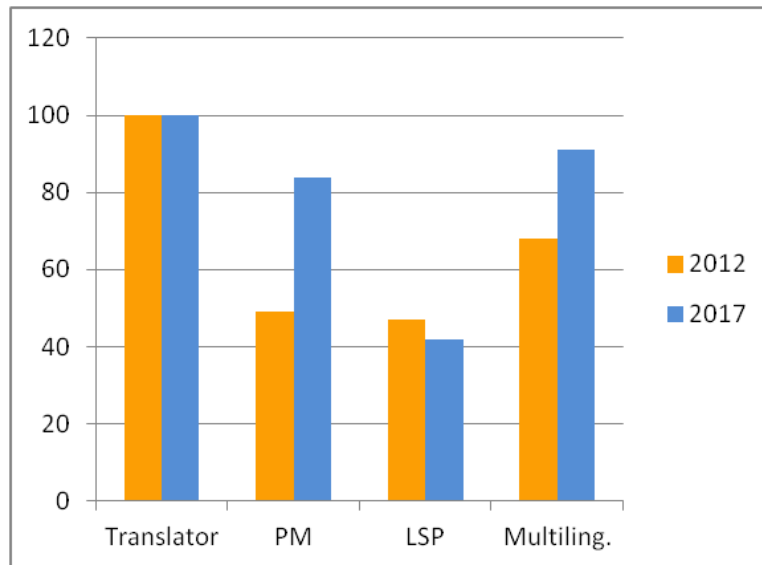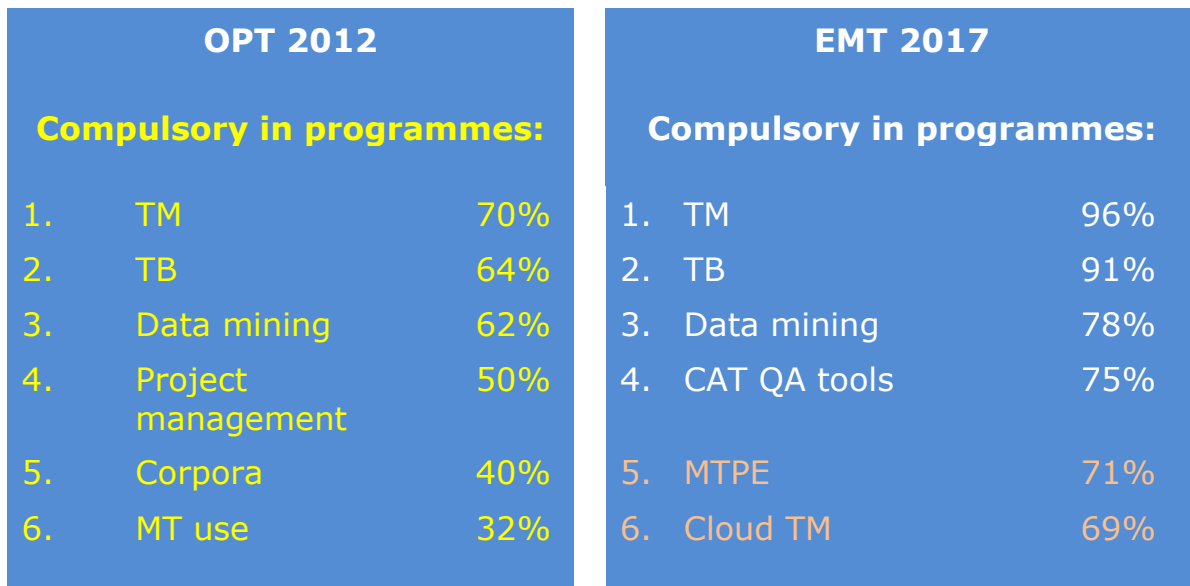
Figure 4. Role perspectives (%)

These changes seem to reflect an increased embedding of professional workflows, as revealed by many of the 43 comments in response to *Q2.11* (e.g. "Our philosophy is to give a broad view not only of tools, but also and more importantly of the professions behind them"), but possibly also the development of more sophisticated project management features within commercial tools.

3.3 Main Activities

Q.3.1 (activities) listed 22 different types of tools use and asked whether they were compulsory or optional, and constituted a major or minor part of the programme. Although there were some new or rephrased items (mainly relating to cloud-based tools, statistical machine translation and post-editing, and games/software localisation), meaningful comparisons with OPT2012 are possible. In 2012, each of the top 12 activities was not included among the compulsory teaching of a significant proportion of all programmes, ranging from [20%] to [60%] (Figure 5):

OPT 2012			**EMT 2017**		
Compulsory in programmes:			**Compulsory in programmes:**		
1.	TM	70%	1.	TM	96%
2.	TB	64%	2.	TB	91%
3.	Data mining	62%	3.	Data mining	78%
4.	Project management	50%	4.	CAT QA tools	75%
5.	Corpora	40%	5.	MTPE	71%
6.	MT use	32%	6.	Cloud TM	69%

Figure 5. Top 6 compulsory activities (tools use - new items in pink)

The top 3 compulsory items in 2017 (Translation Memory, Termbase use, and Data Mining) were the same as in 2012, but the proportion of programmes teaching them had increased dramatically (TM up from [70%] to 96%, terminology/termbases [TB] from [64%] to 91%, and Data Mining from [62%] to 78%) (Figure 6):
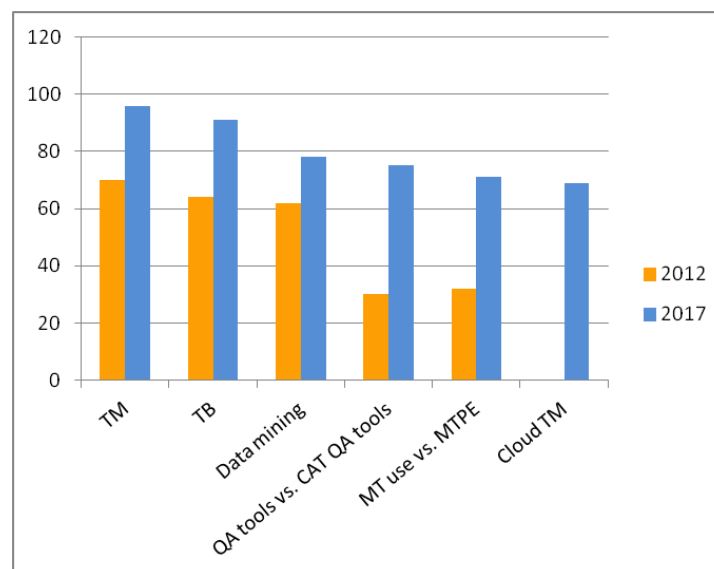
Figure 6. EMT2017 top 6 compulsory activities (%)

Even more striking is the strong presence of the activities ranked 4th to 6th in 2017 (75% - 69%), compared to ([50%] - [32%]) in 2012, and the great

increase in their prominence: both Quality Assurance (ranked 7th in 2012; see below) and MT use/post-editing more than doubled, while cloud-based Translation Memory came from nowhere in 2012 to occupy 6th place as a compulsory item in 69% of programmes.

Similar trends can be observed in the activities ranked 7th to 12th. Not only did the topics change, but their compulsory prevalence in programmes was double that observed in 2012 (Figure 7):

OPT 2012			EMT 2017		
Compulsory in programmes:			**Compulsory in programmes:**		
7.	QA tools	30%	7.	Term extraction	67%
8.	Web localisation	28%	8.	MT quality evaluation	53%
9.	Subtitling	20%	9.	Web localisation	47%
10.	DTP	18%	10.	TMS	42%
11.	SMT training	16%	11.	Software localisation	36%
12.	Web editing	16%	12.	Subtitling	35%

Figure 7. Compulsory activities (tools use) 7-12 (new items in pink)

MT quality evaluation (separate from MT use or post-editing) was a new entrant, along with stand-alone Translation Management Systems (TMS), while web and software localisation and subtitling were much more prominently represented than in OPT2012 (Figure 8):
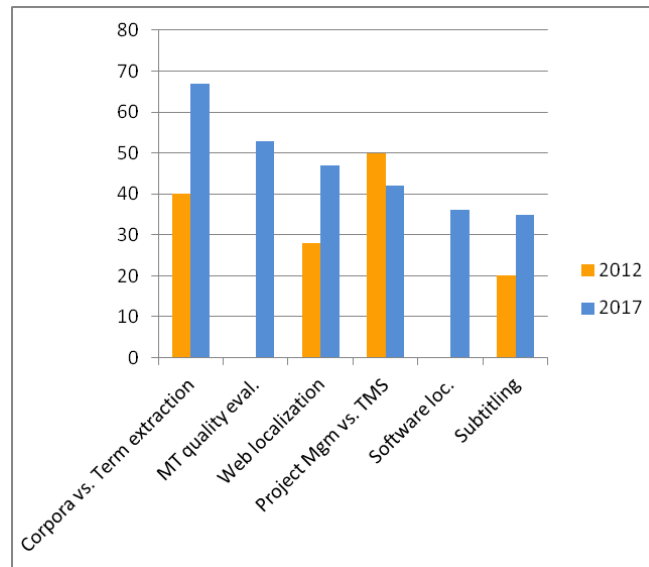
Figure 8. EMT2017 activities 7-12 (%)

In general, it is clear that a much more diverse range of tools-based activities were being taught in 2017 than in 2012, reflecting the expansion of areas such as audio-visual translation in the language industries.

In *Q3.2,* one respondent observed: "Unfortunately, colleagues teaching translation are reluctant to integrate tools into their classes," but there were fewer comments of this type in the 2017 survey, and several countervailing examples, e.g. in *Q3.4*: "The skills in using translation tools are put into practical use through all the practical specialised translation classes." *Q3.3 (compulsory role of tools in other modules)* was new to the 2017 survey, and strongly confirmed that translation technology teaching is now widely embedded throughout programmes. 65% of respondents identified it as a component in a module introducing the translation market and professions, 62% in a skills lab module, and 58% in an internship module. Tools also figured in many practical translation classes (55%), modules in translation theory (45%), extended translations (42%), and dissertations (36%).

3.4 Tools Taught

Section 4 aimed to establish which translation tools are most widely taught.

Q 4.1 (translation software) listed 36 software products, both commercial and open source, many of which were also listed in OPT2012, but with some new entrants such as Fluency, Lilt, and MT@EC, the European Commission's in-house MT system, to which EMT programmes had been granted privileged access. Respondents were asked to specify whether a given tool was compulsory or optional, and the approximate ratio of students to licences.

Among the compulsory tools, software by SDL appears to have maintained the dominance identified in 2012 (when many programmes had still not upgraded from Trados 2007) (Figure 9):
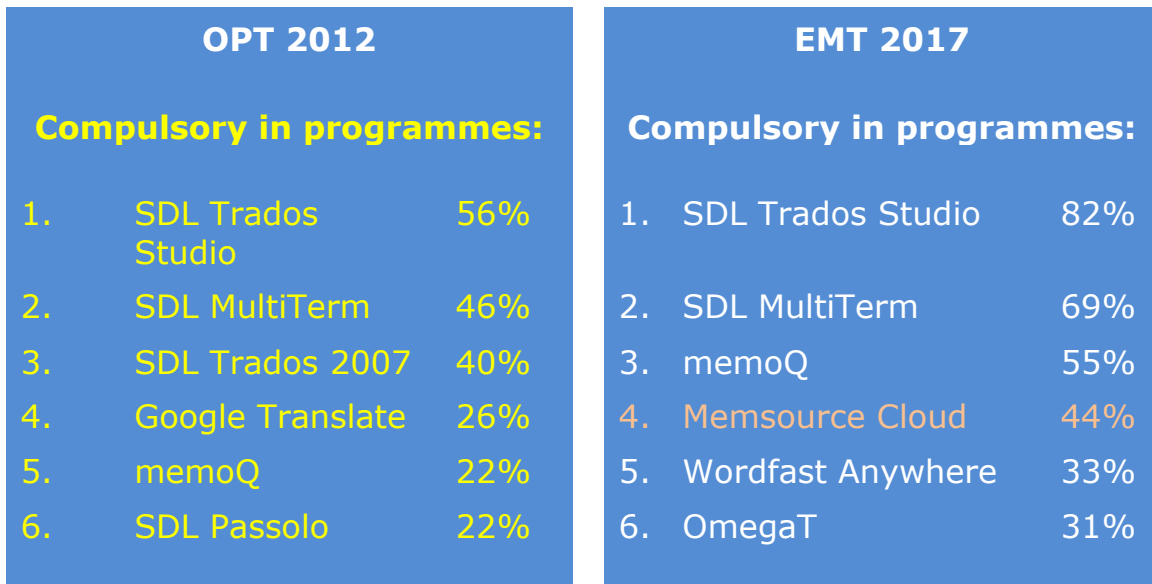
OPT 2012			EMT 2017		
Compulsory in programmes:			**Compulsory in programmes:**		
1.	SDL Trados Studio	56%	1.	SDL Trados Studio	82%
2.	SDL MultiTerm	46%	2.	SDL MultiTerm	69%
3.	SDL Trados 2007	40%	3.	memoQ	55%
4.	Google Translate	26%	4.	Memsource Cloud	44%
5.	memoQ	22%	5.	Wordfast Anywhere	33%
6.	SDL Passolo	22%	6.	OmegaT	31%

Figure 9. Top 6 translation tools taught (new item in pink)

Use of SDL's MultiTerm terminology management package increased substantially between 2012 and 2017 (from [46%] to 69%), but the most dramatic changes were the progression of memoQ (from [22%] to 55%), and the entry of Memsource Cloud (launched in 2011) into the table in fourth place (44%) (Figure 10):
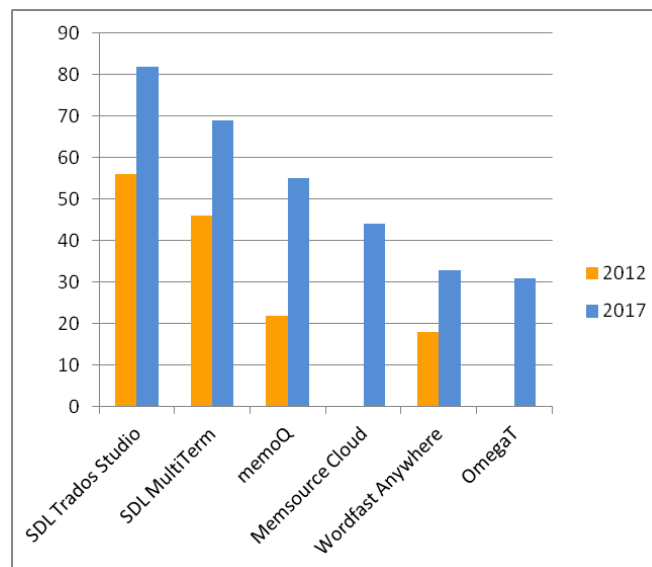

Figure 10. Top 6 tools in 2017 (%)

Use of the free online tool Wordfast Anywhere had also doubled, and freeware OmegaT had moved up sharply from a low baseline in 2012, when it was compulsory in only two programmes.

On the other hand, Atril's DVX and MT heavyweight Systran, [8th] and [12th] respectively in the OPT2012 listing, dropped out of the top dozen, along with other "traditional" CAT tool Star Transit [11th], which however, like Across, retained a significant following of 9%. Some more recent innovators in the CAT market, including Lilt and Fluency, were not yet widely taught in 2017, though Wordbee was compulsory in 15% of respondent programmes. In the 7th to 12th place listing in EMT2017, SDL's software localisation tool Passolo fell from [6th] to 8th place but increased its following to 29% (its main competitor, Alchemy Catalyst, was at 15%). The biggest change, however, was the arrival of corpus analysis and statistical (then neural) MT tools (Figure 11):

OPT 2012			EMT 2017		
Compulsory in programmes:			**Compulsory in programmes:**		
7.	Wordfast Classic	20%	7.	AntConc	29%
8.	Déjà Vu X/DVX2	18%	8.	SDL Passolo	29%
9.	Wordfast Anywhere	18%	9.	Sketch Engine	22%
10.	Google Trans. Toolkit	13%	10.	MT@EC	20%
11.	Star Transit	10%	11.	KantanMT	18%
12.	Systran	10%	12.	Matecat	16%

Figure 11. Compulsory tools 7-12 (new items in pink)

AntConc, a conventional concordancer, and Sketch Engine, with its sophisticated statistical term extraction capability, may be associated with the increased importance of data mining identified in section 3.3 above, though it should be noted that corpus analysis already emerged as a compulsory activity in [40%] of responses to OPT2012 (Figure 12):
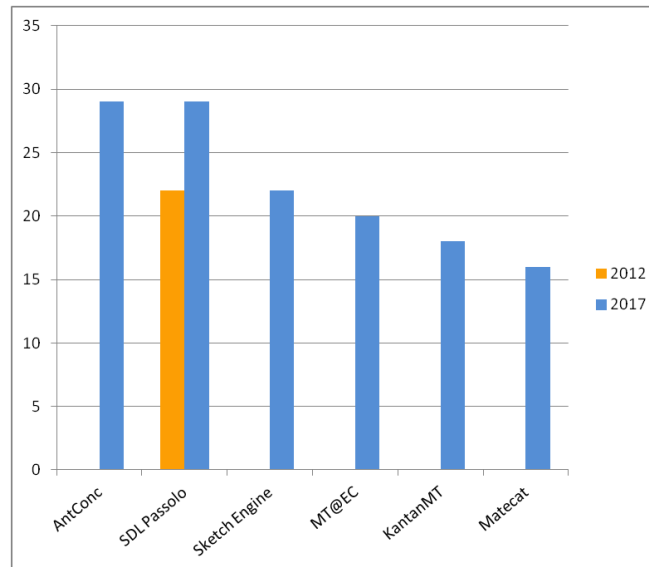
**Figure 12. Compulsory tools 7-12 (%)**

The entry into the 2017 table of MT@EC suggests that EMT programmes were starting to make advantage of the DGT's invitation to use its in-house MT tool (recently rebadged eTranslation), while KantanMT allows students to gain experience of building and evaluating their own MT engines, and both systems were moving over to the latest neural technology. Finally, Matecat was the most popular of the new breed of cloud-based tools which integrate conventional CAT and MT functionalities in a single translation environment, and whose role in training programmes looks likely to expand in the future.

Q4.2 (tools selection and licensing strategy): 33 responses were received to this free-text question. Respondents highlighted as priorities: market relevance (teaching tools that were in demand professionally), student access (ensuring students can access any taught tool on a one-to-one basis as required), and economy (using free tools where possible, not buying more licences than were needed). Some programmes (notably those in France) had been able to negotiate free licences for leading products such as SDL Trados Studio, while others had needed to secure internal funding to purchase licences (one recently-launched programme described the cost of such licences as "simply prohibitive"). Other comments referred to the desirability of teaching transferrable (i.e. product-independent) tools skills, and of exposing students to a mix of workstation and cloud-based tools. Among the tools not listed in *Q4.1*, reference was made to: Subtitle Workshop, Subtitle Edit, and XliffEditor, as well as a range of handy utilities not specific to translation.

3.5 Tools Themes

Section 5 of EMT2017 looked at the perceived relative importance of a range of tools-related themes in respondent MA programmes.

Q5.1 (themes) listed 13 topics, including the history and development of translation tools, tools within translation projects, professional workflows, MT post-editing, industry standards, legal issues, and tools in crowd-sourced and volunteer translation, inviting respondents to rank the importance of each, and to suggest further themes not included in the list. The top ranking of themes considered important or very important was remarkably similar between the two surveys (Figure 13):
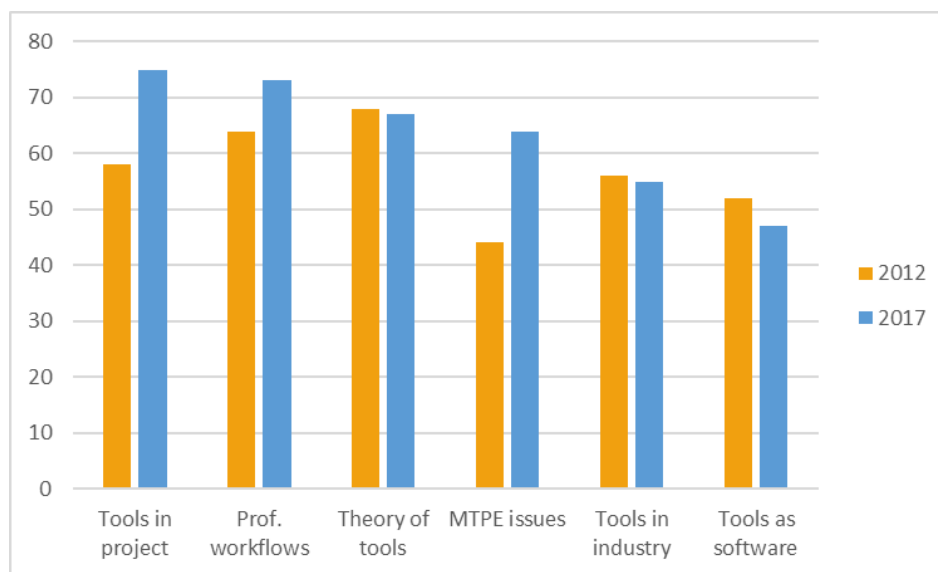
Figure 13. Top 6 tools themes (%)

However, the use of tools in projects rose substantially from [58%] to 75% (i.e. from [3rd] to 1st place), while MT post-editing rose from [44%] to 64% (from [9th] to 4th place). Another difference is that the distribution of topics has become less balanced recently: the top four themes occupy a prominent position as compared to the list tail, which is set apart from the rest of the list by a gap of almost 10%, whereas the spread among theme categories was not more that 6% in 2012. This tendency suggests that the top themes are given a greater emphasis in the course design.

Lower down the table, the perceived importance of teaching generic file-handling and advanced Office skills (11th and 12th place, respectively) declined significantly between 2012 and 2017, perhaps because students nowadays are found to be better prepared in these areas then they used to be (Figure 14):
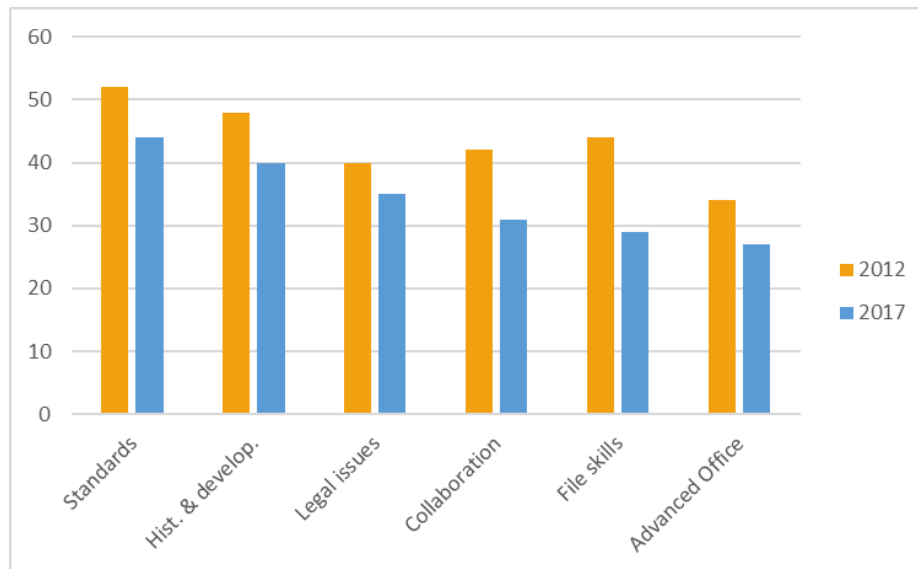
Figure 14. Tools themes 7-12 (%)

The 15 free-text comments in response to *Q5.2* generally confirmed that programmes in 2017 attributed even more importance to professional workflows and changing market conditions than they had in 2012 (e.g. "We focus on the simulation of translation projects more than on theory and history of the tools"). However, other respondents stressed the importance of teaching the background and principles of tools (e.g. "it is vital for students to understand historical roots and development of tools, metrics, standards, etc."). The only additional suggestion for an important theme was: translator's ethics.

Q5.3 (teaching and assessment strategies) asked respondents to identify which of 6 teaching strategies and 6 assessment strategies their programmes used, and to rate their importance numerically.

Among teaching strategies, Learning through staff lecture/demonstration (which was not listed as an option in 2012 because the focus of the corresponding questions was different) came out top, used by all programmes except one and regarded as important or very important by 80% of respondents. Learning through individual work, used by all programmes, was regarded as (very) important by 78% of respondents (down from [97%]), and team and group learning, also universally used, had a comparable importance score of 73% (down from [88%]) (Figure 15):
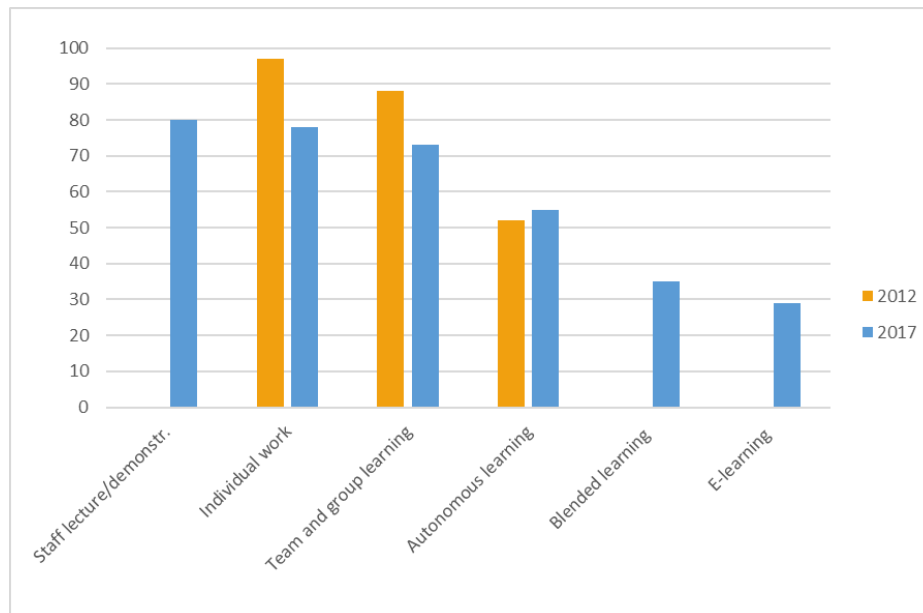
Figure 15. Teaching strategies regarded as important and very important (%)

Autonomous learning from manuals and Help systems was ranked (very) important by 55% of respondents (up from [52%]) but was apparently not used at all by 3 programmes. E-learning (not used by 19 programmes) scored 29% for importance, while blended learning (not used by 15) scored 35%. These last two categories, not captured in OPT2012, suggest a modest shift towards e-learning that might account, at least in part, for the apparent decline in the perceived importance of some of the more traditional teaching and learning strategies.

In terms of assessment of students' tools knowledge, Assessment by practical tools-based task was perceived as the most important strategy at 87% (up from [80%]), though not used by two programmes. Assessment by individual work was ranked (very) important by 76% of respondents (down from [95%]), but again not used at all by two programmes. Team or group work assessment was not used by 8 programmes and received a 49% importance score (down from [80%]) (Figure 16):
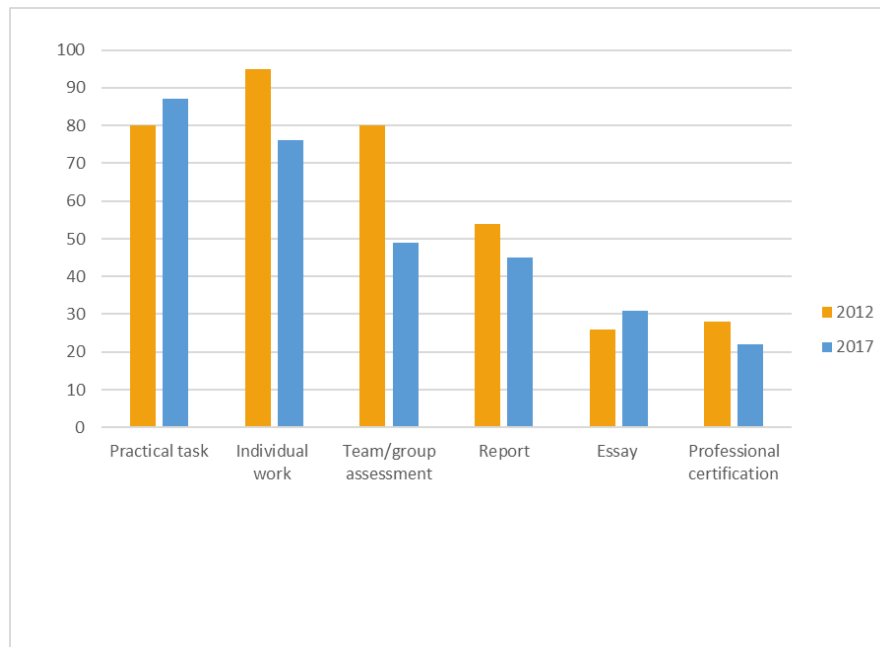
Figure 16. Assessment strategies regarded as important and very important (%)

This suggests that more assessment was being done by practical project in 2017 than in 2012, but the rather steep decline in group assessment suggests that it is increasingly on an individual basis, with evident implications for staff assessment workload. Figures for the three less important assessment options (Report at 45%, down from [54%], Essay at 31%, up from [26%], and Professional certification tests at 22%, down from [28%]) remained broadly comparable between 2012 and 2017. Nearly half of EMT2017 respondent programmes made no use of professional certification tests in their assessment, which is perhaps paradoxical in view of the drive towards increasing professionalisation of programmes.

Q5.4 comments: the 19 free-text comments on teaching and assessment strategies advocate a wide range of practices, from blended learning, to oral presentations, or assessment by professional certification tests (though most respondents who mention these stress that they are not compulsory for students). One respondent describes a blended learning approach to practical exercises, assessed through commentaries. Another stresses the importance of formative feedback from peers, a topic that was not included in either survey. Other thought-provoking comments relate to mixed cohorts of students (some working by videoconference), and the distinction between the skills needed to use a specific tool and "knowledge and critical thinking the students can demonstrate about use of technologies."

3.6 Teaching Staff, Student Access, IT Support

Section 6 of EMT2017 was devoted to the material conditions of tools training delivery within programmes and produced some significantly different results from OPT2012.

Responses to *Q6.1 (who teaches tools and technologies?)* showed that in 2017 only 22% of programmes relied solely on salaried academic staff, as against [38%] in 2012, although 42% mostly used such staff (compared to [25%] in 2012), giving closely similar figures for overall reliance on academics of 64% and [63%], with a slight implied shift towards external professionals. 22% of programmes reported a roughly equal balance between academics and external professionals, 7% used a majority of external trainers, and just one programme relied entirely on such experts, making a total of 31% of programmes that relied for half or more of their teaching on external professionals (down from [43%] in 2012). Around 5% of respondents selected Other for this question, and it seems from free-text responses to *Q6.2* that in some cases PhD students or junior researchers were being used to teach tools — which in turn implies that more PhDs are now being undertaken in this area than was the case in 2012.

Q6.3 (qualifications of trainers) produced substantially different answers from the equivalent question in OPT2012. Although several of the 24 free-text responses to *Q6.4* expressed uncertainty about the definition of a "formal qualification" in tools, it is clear that there has been dramatic progress in this area: in 2017, 75% of programmes reported that half or more of their trainers held a formal qualification in tools, as against [46%] in 2012, while only 6% reported that none of their staff were so qualified (as against [29%] in 2012). The types of qualification referred to in *Q6.4* include PhDs (e.g. in Computational Linguistics, Computer Science), BAs, MAs and MScs in Translation Studies, and SDL Trados Certification. Several respondents also suggested that practical experience with tools in the language industry could be considered equivalent to a formal qualification.

The results of *Q6.5 (experience of trainers)* were no less dramatic. In OPT2012, [70%] of programmes reported that more than half of their teaching staff had five years' experience or more, while in 2017 this figure had risen to 96%, including 44% in which all staff and a further 44% in which most staff had that level of experience (and no programme reported being entirely without such staff) (Figure 17):
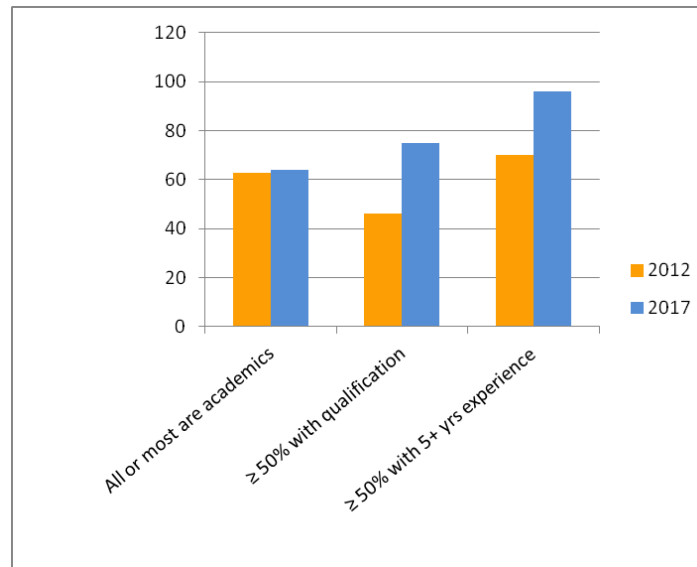
Figure 17. Staff type, qualifications and experience

Among the 13 comments received in response to *Q6.6*, one complained of understaffing in this area, and another of the difficulty for even experienced trainers of keeping up with the rapid evolution of tools; others described various degrees of specialisation, and industry involvement, among tools trainers on their programmes.

The next eight questions in EMT2017 related to student access to IT facilities and software licences. *Q6.7 (ratio of students to workstations)* revealed that the proportion of programmes with one computer for each student rose slightly, from [74%] to 78%, and no programme reported a ratio less favourable than 1:2. One of the 14 respondents to *Q6.8* remarked: "the question is outdated because all students and teachers use mobile technologies (notebooks, iPad, mobile phones, etc.) for all their work," and although this seems to be a minority situation, another respondent pointed out in a related vein that "[students] tend to use their own PCs more and more." A greater shift is visible in *Q6.9 (out of class lab access)*, where 87% of respondents confirmed that this is possible in their programmes, compared to just [54%] in 2012. Many of the 24 comments recorded under *Q6.10* relate to the number of labs available, opening hours, access to facilities in the library, floating licences, and other practicalities. One respondent comments: "Due to binding health and safety regulations, students may only access labs under a teacher's supervision."

This leads on to *Q6.11 (remote tools access)*, to which 16% of respondents replied that all tools were accessible from off campus, 20% most tools, and 49% some tools, making a total of 85% (up from [58%] in OPT2012, though the increase is doubtless explained in significant measure by the rise of cloud-

based tools in the intervening years). A comment in response to *Q6.10*, "We provide student licences so that students are able to install the tools on their own computers so that they have access to the tools at all times," links up with *Q6.12 (licences on students' personal devices)* and *Q6.13 (integration of personal devices into tools classes)*, both new to EMT2017. 9% of respondents to the former indicated that there were personal licences for all tools and 25% most tools, while just over half (51%) said some tools could so be installed (again, the increased presence of cloud-based and free tools will almost certainly have boosted these figures). In response to *Q6.13*, 11% of respondents said they relied on personal devices in one or more modules and 42% said they were an optional extra, while 47% confirmed that their classes used only lab facilities (Figure 18):
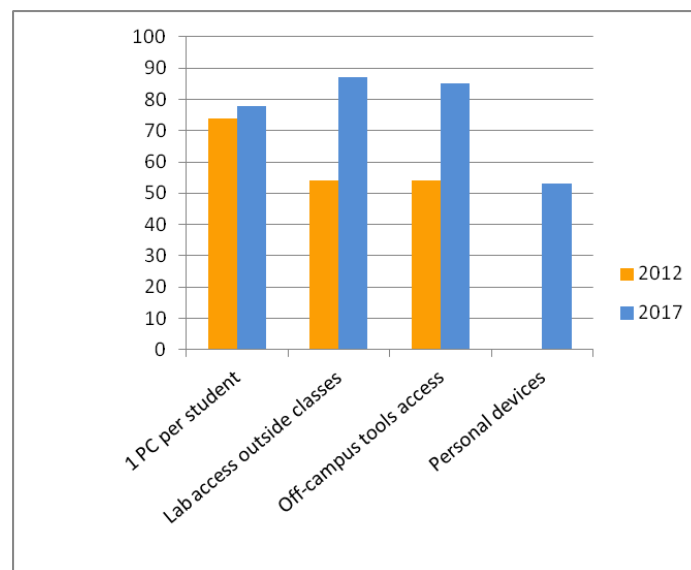

Figure 18. Student access to tools

The 20 free-text comments in *Q6.14* describe a range of strategies for getting students access to free and commercial tools on their personal devices, in some cases implying inconsistent policies on the part of the tools vendors. One respondent raises the case of distance students; another states that "Personal devices [are] used to compensate for technical problems."

The final question in Section 6, *Q6.15 (servers and technical support)*, shows much less variation between the situations in 2012 and 2017. A minority of programmes (36%, a percentage identical to 2012) had the use of dedicated servers, and almost the same proportion (35% vs. [36%]) were able to share a specialist server with other programmes, whereas 71% (up from [58%]) relied on generic institutional servers (some programmes clearly make use of both specialist and generic server facilities) (Figure 19):
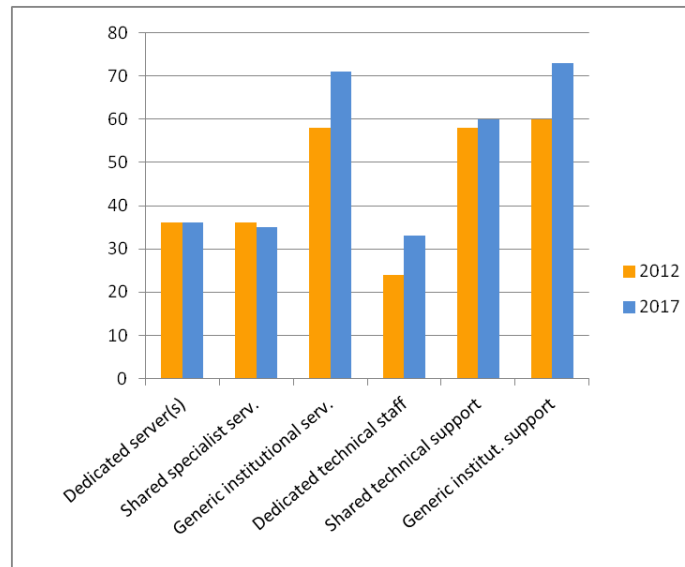
Figure 19. Server infrastructure and technical support

With respect to technical support, things seem to have improved somewhat since 2012, with 33% of respondents reporting that they had dedicated support staff (up from [24%]), 60% sharing technical support with other programmes (up from [58%]), and 73% accessing generic institutional support (up from [60%]). These figures suggest generally positive trends towards the normalisation of the requirements for teaching translation software within universities, and a recognition of the need for infrastructure and support.

3.7 Five-Year Prospects and Threats

The aim of this section of EMT2017 was to capture the sentiment of respondents towards likely developments in the field of translation tools and technologies training in the medium term.

Q7.1 (opportunities and challenges) set out 11 opportunities and 5 possible threats, asking respondents to rank their probability according to a numerical scale. In some cases, the proportion of respondents rating opportunities as likely or very likely to occur changed significantly from OPT2012. The expectation of increased student demand fell from [64%] to 53%, and of the creation of new programmes from [50%] to 38%, while the suggestion that new collaborative programmes would come into being remained almost constant at 45% compared to [46%]. On the other hand, the expectation of an expansion of the tools element of programmes was sharply up, from [66%] to 78%, as was the expectation that new tools would be introduced, from [60%] to 80%. There was also a modest increase in the expectation of new methods such as e-learning ([50%] up to 58%) (Figure 20):
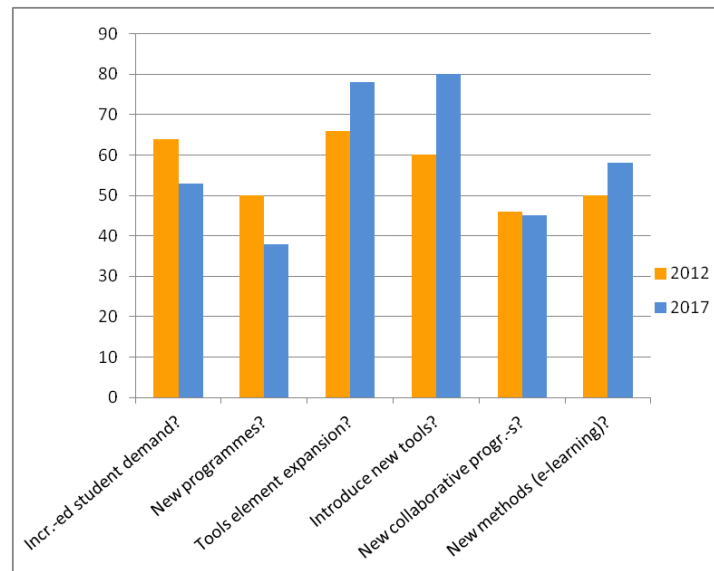
Figure 20. Opportunities vis-à-vis tools and technology training

The trend of increased expectations in relation to tools continued through the list, with 82% of respondents foreseeing more complex technology (up from [64%]), 82% expecting tools to move to the cloud (up from [58%]), and 76% expecting an increased role for MT in the language industries (up from 58%]) (Figure 21):
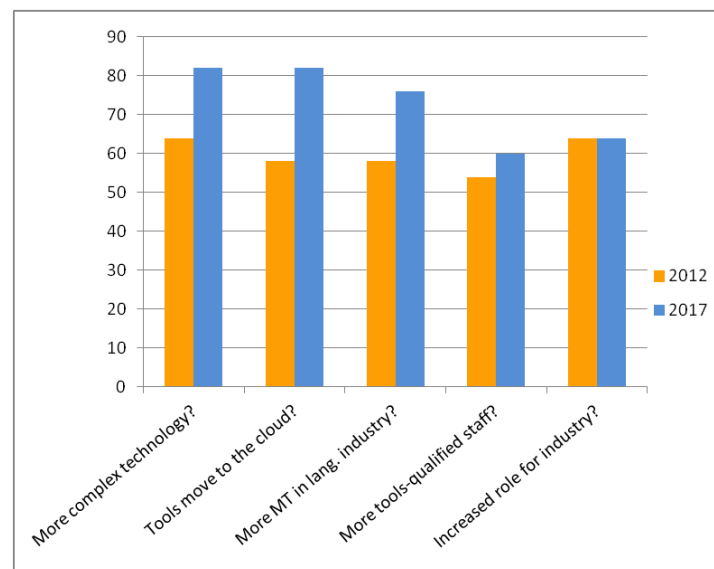

Figure 21. Opportunities (cont.)

The rise in expectations that more tools-qualified staff would become available was more modest (up from [54%] to 60%), and the expectation of an increase

in the role for industry in programmes stayed relatively high at 64% in both surveys.

These generally optimistic perspectives on the future expansion of the role of tools and technologies in translator training are matched by a striking decline since 2012 in the level of perceived threats to individual programmes. Only 22% of respondents thought that a lack of trained staff was likely or very likely (down from [36%]), and the threats of a lack of IT facilities (just 7%, reduced from [26%]) or technical support (18%, reduced from [26%]) were also significantly downgraded (Figure 22):
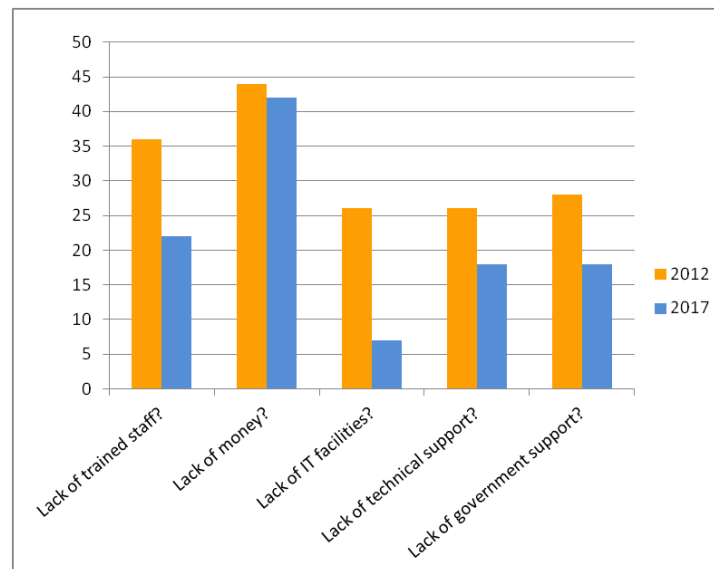
Figure 22. Threats

The fear that programmes could be hampered by lack of government support also declined (18%, down from [28%]), as, marginally, did the fear of insufficient financial support, which however remained relatively high at 42% (down from [44%]).

Among the 19 respondents who commented on these future developments in *Q7.2*, several mentioned plans for increased cooperation with the translation industry. Other interesting responses relate to legal issues with software licensing, the difficulties universities have in understanding and keeping up with industry developments, and the lack of opportunities for practical research at PhD level in the Humanities. There are also some expressions of concern about lack of financial and technical support by institutions.

3.8 Examples of Good Practice

The final substantive section of the EMT2017 survey (*Q8.1*) gave respondents the opportunity to describe any aspect(s) of their programme that they believed exemplified good or innovative practice in teaching tools and technologies. For the full details, readers should consult the survey results (Rothwell and Svoboda 2017b), but key themes that emerged from the 32 responses include:

- Increased embedding of tools in practical translation classes, including assessment (e.g. use of MT in exams);
- Increased attention to the presence of tools throughout the workflow process;
- Inclusion of related technologies such as voice recognition;
- Participation in collaborative projects (e.g. OPTIMALE, OTCT), including by distance methods;
- Increasing presence of online tools training through distance-delivery courses;
- Expansion of simulated translation bureaus, including internationally;
- Increased cooperation on translation projects with external companies and agencies, including European Commission, NGOs;
- Collaboration with external bodies on training and standards;
- Multidisciplinary collaboration (law, medicine) on corpora, terminology;
- Crowd-sharing terminology work done in collaboration with, and for use by, companies and official agencies;
- Increased role of MT training, including engine-building and evaluation using TQA metrics;
- Organisation of conferences and summer schools devoted to translation technologies.

4. Summary of Findings from the EMT2017 survey

- Q3.1: only two respondent programmes had been launched since OPT2012, confirming the end of the bulge in programme creation that characterised the first decade of the 21st century. Otherwise, programme demographics were similar between the two surveys.
- Q3.2: tools and technologies have now become ubiquitous and occupied a significantly larger proportion of programme time in 2017 than in 2012. Many more programmes are now teaching them from the perspective of project managers, and through multilingual projects, in addition to the perspective of the individual translator.

- Q3.3: the top 12 tools activities are now compulsory in a much higher percentage of programmes, and new entrants (e.g. MT Post-Editing, Cloud TM) are much more prominent than their equivalently-ranked counterparts were in 2012. A wider range of professional applications (e.g. in audio-visual translation) is now being regularly taught, and tools have become more thoroughly embedded across programmes as components in other modules, despite some evidence of residual reluctance from other staff.

- Q3.4: the list of software taught as a compulsory element of programmes remains headed by SDL products, but with the notable exceptions of memoQ and OmegaT, other workstation-based CAT tools have declined in popularity, with a marked shift towards cloud-based products. Among these, Memsource Cloud is a significant newcomer. Another big shift between 2012 and 2017 is the new prominence in training programmes of corpus-analysis software and statistically-based (most recently neural) machine translation technology.

- Q3.5: a broad range of teaching and assessment themes and strategies was reported, showing a high degree of consistency between 2012 and 2017. The importance of tools in projects, and of MT post-editing, is perceived to have risen significantly, with a corresponding fall in the need to stress generic IT skills. There was a clear increase in project work for both teaching and assessment, but also an apparent decline in group work in favour of individual work.

- Q3.6: between 2012 and 2017, the balance between academic staff and external professionals teaching translation tools seems to have remained similar. Very significant improvements have however come about in the level of qualification of trainers and their length of experience teaching tools. Both these developments may be an expected consequence of the deeper embedding and maturing of tools as a key component of modern translator training in universities. Student access to software in class time has improved slightly from an already good position, and out of class access is significantly better, as is the situation with regard to individual licences for students' own devices, which are also starting to play a role in teaching. Server infrastructure seems stable and technical support appears to have become more extensive, with a move towards generic central provision, suggesting that the requirements of translation tools and technologies are now better understood at an institutional level.

- Q3.7: Sentiment among respondents was even more positive in 2017 than in 2012 about the prospects for new tools and technologies to play a greater role in translation programmes. Although finance remains a significant limitation on expectations, other perceived threats to programmes seem to have diminished across the board, most dramatically the lack of trained staff, IT facilities and technical support, as universities now seem to support their translation programmes better.

- Q3.8: responses to this section devoted to examples of good practice displayed a high level of reflection and described a range of ideas and approaches of potential value to other programmes.

5. Conclusions

The EMT2017 survey achieved a high response rate among EMT member programmes, but its distribution beyond the Network was not systematic, so its findings cannot be taken as fully representative of the Translation Master's sector. Nevertheless, it gives a clear picture of a mature and complex area of activity, well integrated into its academic environment, with a wealth of professionally-oriented practices that have been developed to bridge the gap for students between academic and professional life. This is not to imply that there is uniformity on either side, for both exhibit a diversity of attitudes towards technology in translation, with some paradoxes regarding the role of technology in today's translation practice — and indeed, teaching. Such attitudes range from a total ban of MT among clients and/or translation agencies/translation teaching institutes, on the one hand, to its wholehearted and uncritical adoption on the other. In between, there is a more sophisticated approach, which gives technology the role it is supposed to play: utilising it to empower translators while being aware of the potential threats posed by such technologies, providing translators with additional potential, as well as accompanying and supporting their talents.

It seems clear, therefore, that at least this advanced group of Master's programmes is substantially in tune with professional realities, in terms of the translation tools and technologies taught, but also the types of learning and assessment exercises now deployed, where tools are often embedded in other translation-related activities. There is also greater professionalisation of tools teaching staff, and programmes feel themselves to be significantly more secure than in 2012. While the surveys do not allow the conclusion to be drawn that these advances are a direct consequence of the existence and action of the EMT Network, it seems likely that EMT has acted as a catalyst in this area, by creating a Europe-wide forum for dialogue between universities and the language industry, and for the exchange of good practice between academic programmes. In any event, the comparison of these two sets of results shows a clear expansion of training in translation tools and technologies among the programmes surveyed, a tendency that looks likely to continue in the foreseeable future.

References

- **Alotaibi, Hind M.** (2014). "Teaching CAT Tools to Translation Students: an Examination of Their Expectations and Attitudes." *AWEJ: Special Issue on Translation* 5(3), 65-74.

- **Austermühl, Frank** (2013). "Future (and not-so-future) trends in the teaching of translation technology." *Revista Tradumàtica* 11, 326-337. http://revistes.uab.cat/tradumatica (consulted 02.10.2018).

- **Bowker, Lynne** (2015). "Computer-aided translation: Translator training." Sin-Wai Chan (ed.) (2015). *Routledge Encyclopedia of Translation Technology*. London and New York: Routledge, 88-104.

- **Chan, Sin-Wai** (2002). *Translation and Information Technology*. Hong Kong: The Chinese University Press.

- **Clark, Robert, Rothwell**, **Andrew and Mark Shuttleworth** (2002). "Integrating Language Technology into a Postgraduate Translation Programme." In B. Maia, J. Haller and M. Ulrych (eds.) *Training the Language Services Provider for the New Millennium: Proceedings of the III Encontros de Tradução da Astra-FLUP*. Porto: Faculdade de Letras, Universidade do Porto, 63-70.

- **Decesaris, Janet A.** (1996). "Computerized Translation Managers as Teaching Aids." Cay Dollerup and Vibeke Appel (eds) (1996) *Teaching translation and interpreting 3: New horizons: Papers from the Third Language International Conference, Elsinore, Denmark, 9-11 June 1995*. Amsterdam: John Benjamins, 263-270.

- **European Commission** (n.d.). *European Master's in Translation (EMT).* https://ec.europa.eu/info/resources-partners/european-masters-translation-emt_en (consulted 02.10.2018).

- **Fulford, Heather and Joaquin Granell-Zafra** (2005). "Translation and Technology: A Study of UK Freelance Translators." *The Journal of Specialised Translation* 4, 2-12.

- **Gambier, Yves** (ed.) (2009). *Competences for professional translators, experts in multilingual and multimedia communication*. https://ec.europa.eu/info/sites/info/files/emt_competences_translators_en.pdf (consulted 28.10.2018).

- **Gaspari, Federico, Almaghout, Hala and Stephen Doherty** (2015). "A survey of machine translation competences: Insights for translation technology educators and practitioners." *Perspectives: Studies in Translation Theory and Practice* 23(3), 333-358. DOI: 10.1080/0907676X.2014.979842.

- **Kenny, Dorothy** (1999). "CAT tools in an academic environment: What Are They Good For?" *Target* 11(1), 65-82. http://dx.doi.org/10.1075/target.11.1.04ken (consulted 02.10.2018).

- **Kenny, Dorothy and Andy Way** (2001). "Teaching Machine Translation & Translation Technology: A Contrastive Study." In Forcada, M. L., J. A. Pérez-Ortiz, D.R. Lewis (eds.), Proceedings of the *MT Summit VIII workshop Teaching Machine Translation*. Santiago de Compostela, Spain. 13-17.

- **Kourouni, Kyriaki** (2016). "Translation Technologies in the Classroom: Friend and/or Foe?" Presentation at the symposium *Best Practices, Challenges and New Horizons in the Teaching of Translation and Translation Technology*, University of Surrey.

https://www.surrey.ac.uk/englishandlanguages/files/cts/Kourouni.pdf   (consulted 02.10.2018).

- **Lakić, Igor and Jelena Pralas** (2016). "Translation Training for the EU: The Case of Montenegro." *Current Trends in Translation Teaching and Learning E* 3(1), 87-118. http://www.cttl.org/uploads/5/2/4/3/5243866/cttl_e_3_laki%C4%87_2c_i._pralas_2c_j..pdf (consulted 02.10.2018).

- **Mellinger, Christopher D.** (2017). "Translators and machine translation: knowledge and skills gaps in translator pedagogy." *The Interpreter and Translator Trainer* 11(4), 280-293. DOI: 10.1080/1750399X.2017.1359760.

- **Moorkens, Joss** (2018). "What to expect from Neural Machine Translation: a practical in-class translation evaluation exercise." *The Interpreter and Translator Trainer*, 12:4, 375-387, DOI: 10.1080/1750399X.2018.1501639.

- **Odacıoglu, Mehmet Cem and Saban Kokturk** (2015). "The effects of technology on translation students in academic translation teaching." *Procedia - Social and Behavioral Sciences* 197, 1085-1094. https://www.sciencedirect.com/science/article/pii/S1877042815043505 (consulted 02.10.2018).

- **Olvera Lobo, María Dolores *et al.*** (2007). "A Professional Approach to Translator Training (PATT)." *Meta: Translator's Journal* 52(3), 517-528. DOI: 10.7202/016736ar.

- **OPTIMALE** (2013). *OPTIMALE Erasmus Network for Professional Translator Training.* http://www.ressources.univ-rennes2.fr/service-relations-internationales/optimale/about-optimale (consulted 02.10.2018).

- **Plaza-Lara, Cristina** (2016). "Instrumental Competence in Translation and Interpreting Curricula in Spain: PreEHEA vs. EHEA Bachelor's Degrees." *Current Trends in Translation Teaching and Learning E* 3, 258-310.

- **Pym, Anthony** (2013). "Translation Skill-Sets in a Machine-Translation Age." *Meta: Translator's Journal* 58(3), 487-503. DOI: 10.7202/1025047ar.

- **Pym, Anthony, Perekrestenko, Alexander and Bram Starink** (eds) (2006*). Translation technology and its teaching: (with much mention of localization)*. Tarragona: Intercultural Studies Group.

- **Rothwell, Andrew and Tomáš Svoboda** (2012). *OPTIMALE Work Package 5.1. New Tools and Technologies: Synthesis Report*. http://www.ressources.univ-rennes2.fr/service-relations-internationales/optimale/attachments/article/37/5.1.%20Synthesis_report_Andrew%20Rothwell.pdf (consulted 02.10.2018).

- **Rothwell, Andrew and Tomáš Svoboda** (2017a). *European Master's in Translation Network: Translation Tools and Technologies Survey 2, 2017* [survey questions]. https://ffuk-my.sharepoint.com/:b:/g/personal/svobtaff_ff_cuni_cz/EQblk0_dxnxHi1tB_7mjg5gBVWBKGSLM6LhkrqebDcNHXA?e=OF4zVZ.

- **Rothwell, Andrew and Tomáš Svoboda** (2017b). *European Master's in Translation Network: Translation Tools and Technologies Survey 2, Summer 2017* [survey responses] https://ffuk-my.sharepoint.com/:x:/g/personal/svobtaff_ff_cuni_cz/EZzjvymvxYhEpoJUrXqSz4gBGtEhwF41xgzbSPAC0QFABw?e=67mpeV.

- **Šanca, Filip** (2017). "Technology: An Essential Part of Modern Translation Curricula. Interview with Dragoș Ciobanu." Memsource Blog. https://www.memsource.com/blog/2017/08/11/technology-an-essential- part-of-modern-translation-curricula/ (consulted 02.10.2018).

- **Šanca, Filip** (2018). *The Use of CAT Tools in University Translation Courses: A Case Study Based on Teaching with Memsource.* Unpublished Master's thesis. Charles University, Faculty of Arts, Prague.

- **Schäler, Reinhard** (1998). "The Problem with Machine Translation*.*" Lynne Bowker *et al*. (eds) (1998). *Unity in Diversity: Current Trends in Translation Studies.* Manchester: St. Jerome, 151–156.

- **Scherf, Willi** G. (1991). "Training, Talent, and Technology." Dollerup, Cay and Anne Loddegaard (eds) (1991). *Teaching translation and interpreting: training, talent, and experience: papers from the first Language International Conference, Elsinore, Denmark, 1991*. Amsterdam: John Benjamins, 153-160.

- **Shuttleworth, Mark** (2017). "Cutting teeth on translation technology: How students at University College London are being trained to become tomorrow's translators." *Tradução em Revista* 22, 18-38. DOI: 10.17771/PUCRio.TradRev.30595.

- **Sikora, Iwona and Marcin Walczyński** (2015). "Incorporating CAT tools and ICT in the translation and interpreting training at the undergraduate level." Grabowski, Łukasz and Piotrowski Tadeusz (eds) (2015). *The Translator and the Computer 2.* Wrocław: Wydawnictwo Wyższej Szkoły Filologicznej we Wrocławiu, 119-133.

- **Svoboda, Tomáš** (2014). "Man and Machine: Translation in the Era of Augmented Reality." Baur, Wolfram *et al*. (eds) (2014). *Man vs. Machine?* Proceedings of the *XXth FIT World Congress*. Berlin: BDÜ Weiterbildungs- und Fachverlagsgesellschaft mbH, 93-99.

- **Svoboda, Tomáš** (2017). "No linguistic borders ahead? Looking beyond the knocked-down language barrier." *TranscUlturAl: A Journal of Translation and Cultural Studies* 9(2), 86-108. https://journals.library.ualberta.ca/tc/index.php/TC/article/download/29355/21427 (consulted 02.10.2018).

- **Thelen, Marcel** (2016). "The Practice-Oriented Translator Training Curriculum: An Example." *Current Trends in Translation Teaching and Learning E* 3(1), 173-174. http://www.cttl.org/uploads/5/2/4/3/5243866/cttl_e_3_thelen_m.pdf (consulted 02.10.2018).

- **Toudic, Daniel and Alexandra Krause** (eds) (2017). *European Master's in Translation Competence Framework 2017*. https://ec.europa.eu/info/sites/info/files/emt_competence_fwk_2017_en_web.pdf (consulted 02.10.2018).

- **Valero-Garcés, Carmen & Carmen Cedillo Corrochano** (guest editors) (2018). *Approaches to didactics for technologies in translation and interpreting*. Trans-kom special issue, Part I, Volume 11, Issue [2]. http://www.trans-kom.eu/index-en.html (consulted 20.12.2018).

- **Williams, Jenny and Andrew Chesterman** (2002). *The Map: A Beginner's Guide to Doing Research in Translation Studies.* Manchester: St. Jerome Publishing.

- **Winkler, Gustav** (1992). "Teaching Technical Translation: An Engineered Approach at Flensburg Polytechnic." Cay Dollerup and Anne Loddegaard (eds) (1992). *Teaching translation and interpreting: training, talent, and experience: papers from the first Language International Conference, Elsinore, Denmark*, *1991*. Amsterdam: John Benjamins, 99-106.

- **Zhang, Chengzhi and Hui Cai** (2015). "On Technological Turn of Translation Studies: Evidences and Influences." *Journal of Language Teaching and Research* 6(2), 429-434. DOI: http://dx.doi.org/10.17507/jltr.0602.25.

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Notes

[1] In an extreme example, one could imagine using a superb alignment module from one tool, advanced Optical Character Recognition (OCR) capabilities of another, MT free of charge in a third tool, leveraging the robustness for complex pre-processing operations in another. Then, in a fifth tool, exporting in an easy format into a user-friendly and customisable HCI interface would be preferred for both interactive translation, and performing quality checks with the help of unique APIs and extensions of limited compatibility.

[2] Other training contexts, such as life-long learning in general and continued professional development in particular are not covered here. However, it appears safe to say that a look at the offer of training of any major translation (and interpreting) association (e.g. those represented in Fédération Internationale des Traducteurs/International Federation of Translators [FIT]) shows the importance translation tools and technology assume in such training catalogues.

[3] For further considerations on tools teaching in bachelor translation programmes (which do not fall within the remit of our research and this article), see, for example, a comparative study of technology teaching among PRE-EHEA bachelor's degrees and EHEA (European Higher Education Area) bachelor's degrees in Spain (Plaza-Lara 2016). The article, in line with the PACTE group terminology, uses the so-called "instrumental competence" to refer — in a broader sense — to using computers in the translation process. Another description of tools teaching on the undergraduate level is Sikora and Walczyński (2015), and others.

[4] Consequently, in many instances, our literature review here is not exhaustive and may be limited to some more recent sources only. By way of example, one of the most recent publications in this regard is Valero-Garcés and Cedillo Corrochano (eds) (2018).

[5] Another, and highly interesting, attempt to propose a state-of-the-art course focussing on a CAT tool, including its project management features, is Šanca 2018.

6 One example of such developments, which call for more or less profound changes to a translation technology curriculum, is the shift from statistical (SMT) to neural MT (NMT) in translation applications. Other include the increasing levels of MT quality (if relevant), the TM/MT mix, advanced terminology management features within CAT tools, formerly confined to specialised software only (e.g. automatic term extraction), corpus management functionalities embedded in CAT tools, new quality assurance (QA) and/or project management (PM) extensions, etc.