

# Investigating demands on language professionals: methodological challenges in exploring translation competence

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Die professionellen Anforderungen an Sprachexperten sind in den letzten Jahren stark gestiegen und umfassen heute nicht mehr nur das Übersetzen im traditionellen Sinne sondern unter anderem auch die Revision von eigenen Übersetzungen und Texten, von fremden Übersetzungen sowie von Texten nicht-muttersprachlicher Autoren. Am Arbeitsplatz zeigt sich dieser Wandel in der Entwicklung neuer Software-Applikationen und neuer Geschäftsprozesse in vielen Übersetzungsdienstleistungsbetrieben. Im Bereich der Forschung wurde bisher allerdings nur wenig unternommen, um herauszufinden, welche Anforderungen diese Übersetzungs- und Schreibprozesse an die kognitiven Ressourcen stellen. Viele Übersetzer sind unter Umständen nicht bereit für den Wandel am Arbeitsplatz und empfinden eventuell eine gewisse berufliche Orientierungslosigkeit. Unser empirischer Ansatz zur Erforschung translatorischer Kompetenz befasst sich mit den methodologischen Herausforderungen von Forschung am Arbeitsplatz und trägt zu einem besseren Verständnis der professionellen Anforderungen an Sprachexperten bei.

**Stichwörter:**

Übersetzen, Kompetenz, Berufspraxis, Translationsprozessforschung, Methodologie

## 1. Introduction

Although in recent years English has become the *lingua franca* of the business and research worlds, the need for well-trained language professionals has actually been growing as more and more companies reach beyond their language area. Understanding the skill sets required in the language professionals' workplace is essential for both the institutions that train them and the organisations where they are employed, which are increasingly dependent on being able to operate in various language environments.

With the rising demand for professional language services, the classic role of the translator has broadened to keep pace with client-oriented technological developments designed to increase productivity, quality and workflow flexibility. Traditional translation from the source into the target language represents only one of the many tasks required of today's language professionals, whose duties will also include adapting texts for different

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readerships and quality levels, self-revising their own translations and revising those of other translators, pre-processing machine translation (MT) input and post-editing MT output, preparing and aligning texts for translation memories (TM), handling MT and TM systems, localisation, terminological research, updating terminology databanks, revising non-native users' writing and proofreading. Evidence of these changes is seen not only in the shifting job market (job advertisements recently posted at the Zurich University of Applied Sciences' Institute of Translation and Interpreting corroborate this trend), but also in the European standard EN 15038:2006<sup>2</sup>, which establishes and defines the requirements for the provision of quality translation services.

While developments in software applications and business processes in translation service companies reflect the changes taking place in the workplace, little research has been done into how they affect the cognitive processes and working practices of language professionals, especially in the increasingly significant areas of revision, information literacy, resource use and translation into a non-native language (L2). To help fill this gap, the Zurich University of Applied Sciences' Institute of Translation and Interpreting has taken up the methodological challenge of developing an empirical research project on working processes to address key issues of translation competence. It is hoped that this will lay important foundations for optimising training, workflow efficiency and output quality at all levels of competence, from novice to seasoned professional.

## **2. Demands on language professionals**

Designed to give translation service providers a set of procedures and requirements to meet market needs, the European standard EN 15038:2006 covers the entire service, from managing translation projects to aspects of the translation process and added value services such as rewriting, adaptation and the revision of translations from third parties. As such it represents an important indicator of current demands in the field. The competences that it requires professional translators to have are: translation competence, described in the standard as "the ability to translate texts to the required level" and including "the ability to render the target text in accordance with the client-TSP [translation service provider] agreement"; linguistic and textual competence in the source language (SL) and target language (TL); research competence, information acquisition and processing, now commonly termed information literacy (see Pinto & Sales, 2008); cultural competence; and technical competence "for the professional preparation and production of

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<sup>2</sup> The EN 15038:2006 is available for purchase through the European Committee for Standardization ([http://www.cen.eu/cenorm/standards\\_drafts/latest+publications/11.asp](http://www.cen.eu/cenorm/standards_drafts/latest+publications/11.asp)).

translations" (EN 15038:2006: 7). When defining the translation process, the standard encompasses not only translation itself but also checking, revision, review, proofreading and final verification (EN 15038:2006: 11-12). In particular, it states that "on completion of the initial translation, a translator shall check his/her own work" (EN 15038:2006: 11).

The skills set out in EN 15038:2006 match the "translator's skills profile" in the outline of the European Master's in Translation (EMT) drawn up by the European Commission's Directorate-General for Translation. Here, too, the emphasis is placed on correctly rendering texts in the TL in accordance with "their intended purpose", on rapid, efficient research through the use of appropriate tools and strategies, and on the capacity to master language technology applications and standard software (European Commission, 2009: 2). As in the European standard, revision is explicitly mentioned as a component of translation competence (European Commission, 2009: 8).

The importance attached to the commission (or "agreement") by EN 15038:2006 and to the translation's purpose by the EMT outline reflects a fundamental requirement of real-world translation. As functionalists have long maintained (Holz-Mänttari, 1984; Nord, 1997; Reiss & Vermeer, 1991; Vermeer, 1989/2004), translation never takes place in a vacuum. Translators are commissioned by clients to translate texts for particular purposes and readerships within the target culture and should be told, or be able to infer, as much as possible about the receivers, time, place, occasion, medium and intended function of the target text (TT; Nord, 1997: 30). Nor are the roles of those involved restricted to commissioners, translators and receivers. Holz-Mänttari, for instance, identifies three additional agent roles in the functional network of what she calls "translational action" (1984: 105ff.): the initiator, the source-text (ST) author and the TT user. Moreover, professional non-literary translation is an economic activity, with commercial interests and needs to consider. Translators must "balance risks and resources" to achieve economical "fit-for-purpose" translation (Martin, 2007: 60), with a corresponding variation in quality demands. The translation service of a leading Swiss bank, for instance, distinguishes between three quality levels, from high for prestige publications and specialised documents to low for documents intended for internal use only with no specialised content. Output quality criteria such as these only add to the complexity of translational action, in which language professionals must bring all their special competences to bear to meet the requirements of the translation brief.

### **3. Professional language skills and translation competence**

EN 15038:2006 and the EMT outline (European Commission, 2009) demonstrate the demands on today's language professionals. However, their descriptions of translation competence are not supported by empirical data

consistent with a comprehensive theoretical model. Indeed, no generally accepted model of translation competence exists, and until recently there has been little empirical research into translation competence as a whole. To rectify this situation, the PACTE Group<sup>3</sup> has proposed a holistic model comprising a cluster of six interacting subcompetences or components (PACTE, 2008: 106ff.). These are: the bilingual and extra-linguistic subcompetences; psycho-physiological components, comprising various types of cognitive and attitudinal components as well as psycho-motor mechanisms; the knowledge-about-translation subcompetence, involving knowledge of translation principles and of the translation profession; the instrumental subcompetence, made up of information literacy and technology skills; and the strategic subcompetence, which controls the entire translation process, rendering it efficient and solving the problems encountered. Of these, only the last three are specific to translation competence as opposed to general bilingualism (PACTE, 2008: 108).

Initial empirical research carried out by the PACTE Group to test the model has been promising (PACTE, 2005, 2007, 2008). It suggests, for instance, that the instrumental subcompetence is a major feature distinguishing the problem-solving decisions taken by expert translators from those of non-experts (PACTE, 2005: 612, 615ff.), which confirms results obtained from similar investigations (e.g. Livbjerg & Mees, 2003; Tirkkonen-Condit, 2005). On the basis of such findings, our own institute has introduced dedicated courses in information literacy and research techniques, with positive effects on student performance (Massey, Riediger & Lenz, 2008). Comparable initiatives are being undertaken at other translator training institutions (see Pinto & Sales, 2008).

The research done by the PACTE Group is only now yielding concrete empirical results, and more work is clearly needed. It is also open to question whether the PACTE model is fully applicable to workplace processes, practices and demands. For example, while sharing many features with the skills sets defined by EN 15038:2006, the model makes no particular distinction between forms of checking/revision and actual translation, despite the importance attached to this activity not only by EN 15038:2006, but also by job descriptions for senior translation positions in the private sector and at international organisations such as the EU, UN, OECD, WTO, ILO and IMF. There is thus a strong case for more extensive empirical research in this (see Mossop, 2007) and other areas to determine whether empirical evidence would justify extensions to the model, similar to those proposed by Göpferich (2008: 155).

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<sup>3</sup> The PACTE (Process in the Acquisition of Translation Competence and Evaluation) research group is based at the Universitat Autònoma de Barcelona.

#### **4. Empirical investigations of translation**

Until fairly recently, much of the empirical research into translation was based on so-called think-aloud methods (translators say what they are doing while they are translating), retrospective protocols (translators say what they did after they finish translating), or comparisons of various drafts of a translation or TT (to infer what happens between stages in the translation process). These techniques have brought the field forward significantly, although they also suffer from certain limitations, such as distorting or slowing down the natural translation process (see Hansen, 2005, 2006; Jakobsen, 2003). For logistical reasons, much of the empirical research into translation has involved trainee translators (usually students) or small numbers of language and translation professionals, doing tasks in more or less controlled circumstances. By manipulating factors such as types of task, translation problems, and available resources, experimental researchers have been able to determine the role these play in the translation process.

With the advent of computers in translation work, computer keystroke logging in combination with think-aloud and/or retrospective protocols opened up opportunities to monitor translation processes with much less impact on the usual behavior of the translator (cf. Englund Dimitrova, 2006; Göpferich, 2008; Rydning, 2005). In most research of this type, translators are asked to perform certain tasks, and all of the keystrokes and cursor movements on the computer, such as deletions and additions, are recorded in a log file. Despite their usefulness in tracking micro-changes in a developing translation, keystroke logging techniques provide only limited information about what resources the translator refers to or what the translator is doing when not entering text into the computer. The computer logs basically reflect the writing process involved in translating. Pauses are recorded in the log, but only if the translator can indicate precisely what a particular pause is for (while thinking aloud or viewing a replay of the log) is it possible to determine whether that time is spent thinking about a particularly challenging translation problem, reading the source text, looking up terms, checking for parallel texts, re-reading the target text, doing relevant research, etc. Monitoring all the changes that take place on the computer screen, however, makes it possible to infer processes occurring during translation, such as when a translator pauses before a word and then opens up an online bilingual dictionary to look for a possible translation. Direct observation of a translator would be one possibility to gather this type of data, as would a video camera set up behind the translator (see Krings, 2001; Trandem, 2005) but such explicit monitoring can disturb the translation process, thereby reducing its ecological validity (i.e. whether the observed process is an accurate reflection of what happens in the real world). Commercially available software is able to record all of the changes taking place on the computer screen (screenshot recordings), which

is invisible and non-intrusive and has been used in various investigations of writing and translation processes (e.g. Asadi & Séguinot, 2005; Degenhardt, 2006).

Triangulating various techniques makes it possible to examine a translation process from different perspectives to gain more insight. It is well recognised that multi-method approaches are the most appropriate for investigating complex cognitive processes such as writing and translation (e.g. Alves, 2003; Brewer & Hunter, 1989; Flick, 2004; Göpferich, 2008; PACTE, 2005; Perrin, 2003, 2006). By considering the development of a target text, pausing and revisions in combination with evaluations of the final translation product and self-report verbalisations about the process, reliable inferences can be made about how translators deal with problems and make decisions (Alves & Gonçalves, 2003; Hansen, 2003; Trandem, 2005). One of the most convincing arguments for a multi-method approach is ecological validity (see Perrin, 2002): investigating translation processes becomes truly relevant to translation competence and practice when the processes investigated reflect actual workplace practices of language professionals and not artefacts of experimental settings and tasks.

Finally, since the definition of translation work has broadened in recent years to include not only translation from STs to TTs, but also editing of machine translation output (post-editing) and revision of other people's texts (EN 15038:2006; Wagner, 2005), investigations into translation processes must also take revision processes into account. Some aspects of checking or self-revision and so-called other-revision (cf. Mossop, 2007) have been identified, but again, with the notable exception of helpful though restricted work done by scholars such as Künzli (2006, 2007), there has been little empirical study of revision skills and strategies in individual translators or comparisons between larger groups of translators at their workplace. In order to help remedy this, our institute has launched a large-scale research project to investigate the development of the skill sets that comprise translation competence.

## **5. Investigating the competence of language professionals: a multi-method approach**

Our project, *Capturing Translation Processes*, uses a multi-method approach that combines observation of the workplace situation, questionnaire surveys and semi-structured preliminary interviews to determine self-reported practices, screenshot recordings of everything that happens on the computer screen, retrospective viewings and commentaries of recorded translation processes as well as additional techniques such as keystroke logging and eye-tracking. The data we obtain allows us to deduce effective translation practices and strategies and gain insight into the cognitive processes involved

in translation work. In this section, we present some findings about revision processes and resource use from the pilot phase of the project as examples of the kinds of insights into the translation process that can be gained from this type of research.

The first set of translation processes analysed and discussed below were obtained from a small group (n=7) of freelance and staff professional translators who participated in a one-day professional development seminar. The professionals were asked to translate a short online news service article from their L2 (German) into their native language (L1), English. The translations were done on computers in our institute, and all screen events were recorded with screenshot software<sup>4</sup>. The translators were trained in the use of the software and had become accustomed to it before they produced the translations that were included in the data corpus analysed here. Immediately after producing their translations, they were shown a replay in real-time of the screenshot recording and asked to verbalise what they saw themselves doing (a "cue-based retrospective verbalisation"; cf. Perrin, 2003). A researcher was present to record everything the participants said in an audio voice-over digital file linked to the screenshot recording and to prompt them to continue verbalising if they stopped commenting.

By analysing the screenshot recordings, we were able to trace the development of the emerging TT, all of the revisions to the text, all of the search terms and electronic resources that were accessed during the translation process and the comments that the translators made about what they had been doing. We thus obtained intermediate versions of the translation at every stage of the process as well as the final TT. In addition, the cue-based retrospective verbalisations provided us with information about why certain decisions, revisions, searches, etc. were made during the translation process.

### 5.1 *Preliminary findings on revision*

One question of interest with these language professionals was the role of self-revision in the translation process. Self-revision is certainly a cost-saving measure and, as we have seen, is specified by EN 15038:2006. However, the data we have analysed suggests that self-revision also carries risks and can detrimentally affect quality (see also Ehrensberger & Massey, 2008). A series of revisions by one professional translator demonstrates not only the dangers of self-revision but also the degree of detail made possible by screenshot tracking of micro changes during the translation process (see Table 1, words of interest marked in bold). In the course of translating and revising the

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<sup>4</sup> Information about *Camtasia* software can be accessed at <http://www.techsmith.com/camtasia.asp>.

sentence *In EU-Staaten müssen immer mehr gefährliche Spielzeuge und Elektrogeräte aus China aus dem Verkehr gezogen werden*, the translator changes the meaning of the German ST *aus dem Verkehr gezogen werden* to such a degree that the final English TT suggests that products are being confiscated at the border before they enter the country in question instead of simply being taken off the market.

Time (hr:min:sec)	Version	Target text
0:07:37	1	EU countries are <b>withdrawing</b> more and more dangerous toys and electrical apparatus from China.
0:09:08	2	EU countries are <b>taking</b> more and more dangerous toys and electrical apparatus from China <b>out of circulation</b> .
0:13:38	3	EU countries are <b>confiscating</b> more and more dangerous toys and electrical apparatus from China.
0:21:46	Final	EU countries are <b>confiscating</b> more and more dangerous toys and electrical apparatus <b>imported</b> from China.

Table 1: TT versions showing changes in meaning during revision (Pro02)

At another point in the TT, the same professional loses significant ST content by deleting relevant quantitative information. When revising his translation of *Fast die Hälfte der mehr als 920 in der EU beanstandeten Waren kamen [sic] aus China*, the translator changes "Almost half the over 920 goods that failed to meet EU safety standards were from China" (Pro02, time 0:16:58) to "Almost half the 920 goods that failed to meet EU safety standards were from China" (Pro02, time 0:24:48). This small but significant distortion of ST meaning by removing "over" can only be explained by excessive revision for stylistic reasons, with the translator failing to refer back to the original German and/or to grasp the purely referential function of this segment of the ST.

In a similar vein, another professional repeatedly expressed concern in her cue-based retrospective verbalisation with the number of times she had used a certain word in her TT:

"One of the problems I found was that we have *dangerous* a number of times... I would have gone back and removed a few of these *dangerouses*. [...] When I finally finish this, I think I still have three *dangerouses* and one *hazardous* or something. [...] That would have been the last thing I did... to read through and see how much repeated vocabulary I have and change anything that came up too much. [...] There's a lot of repetition of *dangerous* [...]". (Pro04)

Indeed, the last revision she made in her translation was to change that word to *hazardous* (Pro04, time 0:21:58). The potential cost in cognitive resources of being distracted by self-revision issues of style was apparent in a minor slip in the same professional's translation. While watching the recording of her translation process and seeing herself type "[...] than electronic equipment fort



he first time in 2006", she commented in her verbalisation "I hope I go back and change that *fort he* to *for the*". She never did.

## 5.2 Preliminary findings on resource use

The data from the screenshot recordings also shed light on further aspects of translation competence, namely information literacy, resource use and search behaviour. This is well illustrated by the way professional translators responded to a potential problem in the ST (the specialised term *EU-Schnellwarnsystem RAPEX*; see Table 2). Four of the seven professionals researched the term, two of them quickly, but only three were successful (one of whom spent almost 25% of the overall time for the translation researching this single term).

Professionals	Target texts	Search duration
Pro02	<i>EU early warning system RAPEX</i>	(no term search)
Pro04	<i>RAPEX, the EU early warning system</i>	(no term search)
Pro07	<b><i>EU rapid alert system RAPEX</i></b>	5 min.
Pro09	<i>RAPEX, the EU Rapid Warning System</i>	11 sec.
Pro10	<b><i>rapid alert system RAPEX</i></b>	42 sec.
Pro11	<i>RAPEX, an early warning system</i>	(no term search)
Pro15	<b><i>EU rapid alert system RAPEX</i></b>	22 sec.

Table 2: Search results and durations for the professional translators (translation into L1; standard solutions given in bold)

At first glance, it might appear that the professional who researched unsuccessfully (Pro09) merely gave up after a short time (11 sec.), but an examination of the retrospective verbalisation protocol provides a different explanation:

"[...] I first thought of *early warning system*... but it's actually *rapid alert system* [...] Actually from going from Google back to my text, I put *rapid warning system*... so it's a mixture of what I guessed and what it actually is. So *rapid warning system* instead of *rapid alert system*, which would be considered a very, very bad mistake, back where I work". (Pro09 RVP)

This professional's heightened awareness of the danger of letting pre-conceptions negatively influence the result of what would otherwise be very effective research techniques was a positive side-effect of the research approach we are using. The translators in this type of research are active participants, who can profit from the insights they gain by reviewing their own translation processes.

We were somewhat surprised by how few professionals researched what was clearly a specialised term, since we are constantly impressing upon our

students how important it is to recognise when they need to use the resources at their disposal to research content and terminology. In fact, all of our students participate in the above-mentioned course in research techniques as part of their undergraduate degree requirements. To assess whether they differ in their search behaviour and use of resources from the professional translators, we randomly assigned sixteen students, all native speakers of German in their final year of our institute's undergraduate translation degree programme, either to a group translating from L1 into L2 or L2 into L1. The former group translated the same online news service article as the professionals had (German-English/G-E) and the other group translated a very similar text on the same topic in the other direction (English-German/E-G).

The results for resource use and search behaviour were quite different for the group of students who translated from German into English: all of them researched the term in question<sup>5</sup>, and all but one of them were successful and very quick (20 sec. or less; see Table 3). The successful students used internet search engines and simple string searches of some combination of *RAPEX* and/or *EU-Schnellwarnsystem* to find the correct term. As is apparent from the screenshot recordings, the unsuccessful student was the only one who referred to in this case wholly inappropriate online bilingual dictionaries rather than the resources that the other students had accessed.

Students	Target texts	Search duration
UE0310	<b><i>RAPEX, the EU rapid alert system</i></b>	16 sec.
UE0311	<b><i>EU rapid alert system RAPEX</i></b>	12 sec.
UE0313	<b><i>RAPEX, the EU rapid alert system</i></b>	7 sec.
UE0314	<i>EU's rapid warning system</i>	2 min.
UE0315	<b><i>EU rapid alert system RAPEX</i></b>	20 sec.
UE0317	<b><i>the EU rapid alert system RAPEX</i></b>	16 sec.
UE0321	<b><i>the EU rapid alert system RAPEX</i></b>	16 sec.

Table 3: Search results and durations for the G-E group of student translators (translation into L2; standard solutions given in bold)

The difference between the success rate of the professionals and students in the *RAPEX* example (Tables 2 and 3) seems to contradict other research findings that experts are more sophisticated in their use of the resources at their disposal (e.g. PACTE, 2005). There are a number of possible explanations for this. As already mentioned, these students had all participated in a course in research techniques and were accustomed to using

<sup>5</sup> One of the students in the group (UE0308) did not complete the translation, so there are no data for this particular section of the text.

internet resources as part of their translation course demands. They were also considerably younger than the professionals, so might be part of a generally more media-competent cohort (see Perrin & Ehrensberger-Dow, 2008). In fact, all of these students mentioned research strategies in their cue-based retrospective verbalisations while viewing the screenshot recordings of themselves translating this particular section of the text. An additional reason for the difference might have been because the professional translators were not at their normal workplaces during the professional development course in which these data were collected. Away from their own computers and familiar settings, they may have been less inclined to access online resources than they normally would.

It is also possible that there is a risk of overconfidence and complacency when people translate into their L1. Since our translation degree programme teaches translation both into the L1 and the L2, we can investigate such questions in more detail. The students translating from German into English were translating into their L2, which might have encouraged them to be more cautious and check resources for unfamiliar terms. An examination of the results for a similar translation problem in the English ST translated by the other group of students suggests that this might indeed be the case (see Table 4). Only four of the eight students translating into their L1 produced standard solutions for the ST term *the rapid alert system Rapex*, all of them after researching it. None of the non-standard solutions were researched.

Students	Target texts:	Research duration
UE0301	<i>Frühwarnsystem Rapex</i>	(no search term)
UE0304	<i>Rapex, <b>das Schnellwarnsystem</b></i>	2½ min.
UE0312	<b><i>Schnellwarnsystem Rapex</i></b>	20 sec. + 5 sec.
UE0316	<i>Schnellalarmsystem Rapex</i>	(no search term)
UE0319	<i>Rapex, ein Sicherheitssystem</i>	(no search term)
UE0320	<i>das schnelle Alarmsystem, Rapex</i>	(no search term)
UE0323	<i>Rapex, <b>das europäische Schnellwarnsystem</b></i>	1 min.
UE0324	<b><i>Schnellwarnsystem RAPEX</i></b>	39 sec.

Table 4: Search results and durations for the E-G group of student translators (translation into L1; standard solutions in bold)

Another explanation for the relative lack of resource use for this particular translation problem might be that *Rapex* looks more like a proper name than an acronym and proper names do not necessarily trigger the use of resources

the way technical content and specialised terms do<sup>6</sup>. However, an examination of the retrospective verbal protocols reveals that two of the students who failed to research the term did seem to recognize that they should have (e.g. UE0319: "I would have googled 'rapid alert system' later to see if it had a German name [...] but I didn't look it up afterwards" and UE0320: "I was wondering whether I should do something so that the German reader realises that Rapex is an abbreviation")<sup>7</sup>. These comments seem to support the notion that translation into the L1 (and not only the self-revision addressed in 4.1) has inherent risks that the data from our multi-method approach can reveal.

## 6. Conclusions

Exploring translation competence by examining various sources of data (from recordings of translation processes, cue-based retrospective verbalisations as well as intermediate and final TT products) has allowed us to highlight the importance of two key aspects of language professionals' work: revision and information literacy. Although revision is recognised as an important skill, it is often viewed as something that is done after a translation is finished: many language professionals may be unaware of how much revision they actually do throughout the translation process and of the potential consequences for output quality. With courses on information literacy for language professionals still in their infancy, resource use and search skills have probably been developed "on the job" by many older practising professionals but, as the results from the professionals in this study suggest, may not always be either efficient or effective.

Before strong claims can be made, however, more research needs to be done to explore the influence of translating into the L1 or L2 on revision processes and resource use. The latter includes both internal, cognitive resources and external, information resources. Only then can systematic measures be developed to optimise training, workflow efficiency and output quality at all levels of translation competence. We have therefore started to study the revision and search strategies used by different groups at their workplaces (e.g. students, novice translators and experienced professionals) with various language combinations, text types and translation problems. We expect that the empirical findings will allow us to extend existing models of translation competence to include revision competence as a separate category of skill sets (as suggested by Hansen, 2008), encompassing unilingual self-revision (common to all producers of texts) as well as comparative self-revision and

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<sup>6</sup> Our thanks to Simon Lenz for suggesting this explanation.

<sup>7</sup> Translations from the original comments made in German.

other-revision (presumably unique to translators and translator-revisors). In addition, workplace data should make it possible for us to develop an ecologically valid definition of information literacy to reflect the competence that today's language professionals require to handle the multimodal resources available to them.

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