

# DEVELOPING WEB SEARCHING SKILLS IN TRANSLATOR TRAINING

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## ABSTRACT

This paper focuses on the development of online information literacy in translator training. First, it highlights the important role that information skills, especially web searching skills, play in translation as a cognitive activity requiring information and constant decision making, among others. Second, it argues that if we are to train translation students to work in different subject areas, text types and topics, our focus needs to shift from the acquisition of specialized knowledge in several domains to the development of information skills that can be used for problem solving in any field of expertise. Third, given that the need to seek, use and generate translation-related information depends on the type of users and translation tasks performed, it emphasizes the need for empirical studies that focus on real users and learning contexts. To illustrate the potential benefits of such an approach, this paper draws on the results obtained in a multiple-case study of the web search behaviours of a small cohort of postgraduate translation trainees in their first year of studies.

**KEYWORDS:** information behaviour, information literacy, web searching skills, documentation, cognitive translation studies

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## 1. Introduction

For more than a decade now, web-based resources have become an indispensable tool for both professional translators and student translators, often replacing more traditional online and offline reference works. Given the ubiquity of the web, with its ease of access to online data and the apparent comprehensiveness of the resources it offers, it represents a natural choice for translators to support their cognitive and knowledge-based activity (cf. Austerlühl 2001). Yet, it is the very ubiquity and structure of the web along with the dispersed and dynamic nature of its content that pose a set of challenges regarding the critical evaluation, selection and use of credible sources of information; hence the need for efficient web searching skills that can be used to access and, most importantly, locate “the information needed to resolve a concrete [translation] problem ..., realizing the needs of quality, rigour, suitability, depth and specificity” (Pinto Molina and Sales Salvador 2007: 534).

In the following section, I will define the key terms that I will be using in the remainder of the paper. In section 3, I will discuss selected typical instructional settings as well as a number of proposed initiatives for acquiring information literacy—including the use of the web for information seeking and retrieval—in translator training. Here, I will argue that, despite the obvious need of teaching translation students how to critically use the web, there is very little research on how students (or, for that matter, professionals) actually search for web-based information. To illustrate how research in this area may be used to inform effective instruction, I will, in section 4, present a multiple-case study that I carried out to explore the web search behaviours of a small group of postgraduate translation students in their first year of studies. Finally, I will outline the main results of my study and discuss possible implications for translator training in sections 5 and 6, respectively, and provide conclusions in section 7.

## 2. On Information Competence, Literacy and Behaviour

Translators’ information competence—also referred to as “documentary competence”, “research competence” or “instrumental competence” in the translation studies literature—is typically situated within multidimensional notions of translation competence. The importance that the former is given within the latter thus varies according to different multi-competence models of translation. Here, skills and knowledge are usually clustered around a number of interrelated sub-competences that make up the notion of translation competence. PACTE, for example, views translators’ instrumental sub-competence as being “made up of knowledge related to the use of documentation sources and information technologies applied to translation” (2005: 610). For Kelly, this sub-competence involves

el uso de fuentes documentales de todo tipo, la búsqueda de terminología y la gestión de glosarios, bases de datos, etc., el manejo de las aplicaciones informáticas más útiles para el ejercicio de la profesión (tratamiento de textos, autoedición, Internet, correo electrónico), además de otras herramientas tales como el fax, el dictáfono, etc. (2002: 14-15).

Translators’ information competence has also been defined from the perspective of translation-oriented documentation and hence referred to as “documentary competence”. Palomares Perraut and Pinto Molina, for instance, define documentary

competence as “las habilidades y destrezas específicas del traductor para saber manejar con precisión y rapidez las fuentes de información de cualquier tipo y en cualquier formato necesarias para su quehacer traductor” (2000: 100). Within the area of translation-oriented documentation we also find specific models for the development of information competence for translators, such as the one proposed by Pinto Molina and Sales Salvador (2008a) and known as “INFOLITRANS” (information literacy for translators). This model draws, among others, on information literacy competency standards like the ones developed by the Association of College & Research Libraries (ACRL 2000). The ACRL—a division of the American Library Association (ALA)—defines information literacy as “a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information” (ibid.) (cf. Pinto Molina and Sales Salvador 2007:535, 2008a: 415; Massey and Ehrensberger-Dow forthcoming). It is a term widely used within the area of higher education in connection with the instruction of information skills that may form the basis for lifelong learning. It is therefore a notion “common to all disciplines, all learning environments, and all levels of education” (ACRL 2000: 2).

Like information literacy, the term “information behaviour” (IB) is only starting to be used in the translation studies literature. This term is commonly used within the disciplines of library and information science (LIS), information studies, user studies and documentation. Although the notion of information behaviour—like the notions of information, instrumental and documentary competence—is not necessarily linked to the instruction of information skills, it does involve “those activities a person may engage in when identifying his or her own needs for information, searching for such information in a way, and using or transferring that information” (Wilson 1999: 249). Furthermore, information behaviour—like information, instrumental and documentary competence as well as information literacy—is a rather broad concept that may apply to a wide range of information sources in various formats. Yet, due to technological changes and the proliferation of online information resources, it is above all users’ web search behaviour that has become a popular object of study in the aforementioned disciplines (i.e. LIS, information studies, user studies and documentation). Much that is known today about users’ information search behaviour on the web is derived from so-called “web searching studies”, in particular qualitative studies “that have followed searchers throughout the process on a few questions” (White and Iivonen 2001: 722).

Web searching (or web-based information search) is a notion that can be found under different headings such as information behaviour (IB); information seeking (IS) or information-seeking behaviour (ISB); information retrieval (IR); and interactive information retrieval (IIR), among others (cf. Wilson 1999: 263; Aula 2005: 5). Most importantly, it is a notion typically restricted to the use of IR systems such as popular search engines. In this paper, however, I will use web searching to refer to all kinds of online actions carried out to seek and retrieve information on the web, i.e. it is not limited to the use of search engines only. I will consequently use the expression web search behaviour interchangeably with other IB-related notions, such as online information/search behaviour or information seeking and retrieval.

### 3. Information Literacy Acquisition in Translator Training

The importance of acquiring information literacy in translator training has long been recognized by the teaching community. In Spain, for example—a country with a significant number of translator training institutions<sup>1</sup>—the development of (online) information skills typically takes place within a core course known as “Documentary Research Applied to Translation” (*Documentación Aplicada a la Traducción*) that has been part of the four-year undergraduate degree in translation and interpreting ever since it was first introduced in 1991. Credits corresponding to both core and optional courses within this four-year degree are distributed across a two-year first cycle followed by a two-year second cycle. Documentary research for translators is mostly taught in the second year of the first cycle (i.e. in the second year of study) and is typically worth four credits (out of 240 credits needed to complete the degree). Although universities can vary the number of credits in each specific area, the core content in translation and interpreting degrees remains practically the same throughout the entire Spanish university system. Yet, despite the apparent rigidity of this system, additional instruction aimed at developing information skills may also take place within optional courses that make up the curriculum, such as “Computer Science (or IT) Applied to Translation”, “Terminology” or “Electronic Tools and Resources for Translation”. The importance that online information skills are given within the curriculum is in fact highlighted in Pinto Molina and Sales Salvador’s (2008b) survey of information literacy instruction in Spain. Here, the authors found that,

well ahead of the rest of the items, the translation and interpreter trainers see the first need of a specialized translator as being the skill of information search (68%). This is followed by subject knowledge (34%), which is, after all, the product of a sound global information competence that is continually being enriched and updated for whatever field of expertise (ibid: 61).

Nevertheless, when teachers were asked which elements they thought needed to be added to the curriculum where they felt “students had not yet acquired the necessary [information] skills”, they suggested “reinforcing knowledge of *documentation techniques in general*” (ibid.) and of information search in particular (ibid: 62). With regard to the latter, Pinto Molina and Sales Salvador state that “teachers are no doubt aware that their students tend to conduct their information searches in an intuitive fashion, low on structuring and only vaguely systematized, and suppose that a search engine like Google ‘knows everything’” (ibid.).

The results of the survey also show that 65% of the teachers thought that “the core component [Documentary Research Applied to Translation] under the existing curriculum does not fully meet the students’ needs” for developing their documentary competence (ibid.). A similar concern is also voiced by Kelly, who, in her overview of the Spanish undergraduate degree in translation and interpreting studies, remarks that courses tend to be disassociated from one another, as in the case of “Documentary Research,” which

is separated from Terminology, despite the fact that much documentary research carried out by translators is essentially terminological in purpose. In most universities, there is no link established among these three areas [computing, documentary research, and terminology] or between them and practical translation activities (2005: 68).

<sup>1</sup> The Spanish Ministry of Education and Science (2011) lists a total of 22 universities offering undergraduate programs in translation and interpreting studies.

It is not surprising, then, that in order to improve information literacy instruction, the teachers in Pinto Molina and Sales Salvador's survey emphasized, above all, the need for closer coordination between teachers of information literacy and those in charge of teaching specialized translation (and interpreting) courses in various areas of expertise. They also remarked that the teaching of documentary research should be extended "with additional instruction in the second cycle [i.e. in years 3 and 4] and the addition of optional courses" (2008b: 64). Another suggestion made—one that I am particularly keen on—refers to the development and/or consolidation of information skills "within each specialized translation field, on the basis of closer links to professional practice and employing a more applied approach with the use of case studies" (ibid.). Such an approach would not only allow for additional instruction in information literacy in translation programs where documentary research courses are already an integral part of the curriculum (such as the Spanish BA degree) but also to compensate for course availability and time restrictions in programmes of a shorter duration. While in Spain most undergraduate programmes in translation and interpreting still maintain the four-year course structure following the adaptation to the European Higher Education Area (EHEA), undergraduate programmes in translation and interpreting offered by other European institutions typically consist of three years of study. In these programs, instruction in information skills via optional courses of study (as opposed to a specific core course on information science and documentary research) seems to be the general case. It also seems to be the case in countries—especially in Anglo-Saxon countries—where translation and/or interpreting studies are only offered at the postgraduate level. Course availability and time restrictions in these programmes may in fact not always allow for a core subject exclusively dedicated to the development of (online) information skills. The integrating of these skills in specialized translation courses (in addition to optional courses) would allow compensating for these restrictions.

Nevertheless, as briefly indicated above, despite the obvious need of teaching translation students how to critically search, use and manage various online information sources, there is very little research done on how students search for web-based information. In this regard, as Massey and Ehrensberger-Dow (forthcoming) point out, "the relative weight accorded to information literacy by translation practitioners, trainers and scholars has yet to be underpinned by a significant body of research". The following web searching study (described in detail in Enríquez Raído 2011a) represents an attempt to contribute to this body of research and show, by way of example, how the web search behaviours of translation students can be explored to facilitate instruction that reflects the real needs of this community of users.<sup>2</sup>

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<sup>2</sup> Other researchers in translation studies who "have only recently begun to systematically examine information behavior in the translation processes of students and professionals" are Massey and Ehrensberger-Dow (forthcoming), whose work is situated within the Zurich University of Applied Sciences' *Translation Tools in the Workplace* project (see also Massey and Ehrensberger-Dow 2010a); or some researchers at the National Research Council of Canada (e.g. Déslites, Barrière and Quirion 2007; Désilets 2007, 2010) as well as researchers working within the University of Graz's *TransComp* project (e.g. Göpferich 2009; Göpferich and Jääskeläinen 2009). Within the field of translation-oriented documentation, Pinto Molina and Sales Salvador (2007, 2008a) have also examined translators' information literacy via survey research. Similarly, White, Matteson and Abels' (2008) focus group study address professional translators' information behaviours within the domain of information science.

#### 4. Exploring the Web Search Behaviours of Translation Students

According to Spink and Cole, “[t]he field of library and information science (LIS) has historically been a leading discipline in conducting research that seeks to understand human information-related behaviours [HIB]” (2006: 1). These have been primarily studied from cognitive, behavioural, affective and, more recently, social perspectives. Yet, the predominant framework for the understanding of HIB has traditionally been what Spink and Cole refer to as the “information-seeking/problem-solving approach” (ibid: 3). The theoretical basis for my own study was primarily informed by this approach but also by other cognitive as well as affective-oriented information-seeking models such as those proposed by Brown (1991), Wilson (1981, 1999), Dervin (1983, 1999) and Kuhlthau (1991)—all of which view IS as the purposive seeking of information in relation to a goal.

Translation-related phenomena have also been examined from cognitive, behavioural, affective and social perspectives, among others. If, however, as Sirén and Hakkarainen point out, “we see translation as one kind of human information processing, [then] cognitive psychology is an obvious framework in which translation can be productively studied” (2002: 72). It is within this framework that translation processes, like IB processes, have also been regarded as problem-solving activities. Tirkkonen-Condit, for example, argues that translation is a goal-oriented action where the solving of “an individual translation problem [...] will cause at least temporary uncertainty in the course of target text production” (2000: 123). My study, as well, draws on the cognitive approach to translation studies, where “the emphasis lies on the application of translation solutions – sometimes called strategies or procedures – to specific problems” (González Davies 2004: 14). Furthermore, similar to other scholars in our discipline (e.g. Lörcher 1991; Krings 1986; Livbjerg and Mees 2003), translation problems have been considered from the perspective of the participants of the study. In line with the principles of cognitive psychology and as Séguinot points out, “[p]roblems ... do not actually exist ‘out there’. It is our perception that identifies something as a problem. In other words, it is the construct of an individual” (2000: 90).

##### 4.1 Research Questions and Aims

Drawing on the theoretical framework briefly described above, I conceptualized web search behaviours as involving goal-driven actions aimed at meeting information needs for translation problem solving. I monitored the participants’ behaviours through a notion that I refer to as “web search task”, and which involves one or more web search sessions performed to address a single information need. While in my terminology, a web search task will always include necessarily a search session, i.e. a temporal series of online actions aimed at satisfying a specific information need (cf. Jansen et al. 2007), it is not limited to or synonymous with the notion of search session. Rather, it is a more comprehensive concept that also includes the identification and formulation of a specific search need, the formulation of one or more search goals, and the selection of a search outcome. Each web search task thus comprises the following units of analysis:

- The *search need*, or recognition of an information need as perceived within the context of translation problem solving.

- The *search goal(s)*, or type(s) of information required to potentially satisfy a specific information need.
- The *search process*, or online actions carried out within one or more search sessions that may address a single or multiple information needs.
- The *search outcome(s)*, or type(s) of information potentially selected and/or used to (a) satisfy a search need, and (b) eventually solve a translation problem—i.e. where the latter is not necessarily a consequence of the former.

These four information-seeking/problem-solving stages were taken to indicate when a web search task embedded in translation problem solving was initiated, processed and completed. Based on these theoretical premises, I set out to explore translation students' web search behaviours—including affective aspects such as their perceptions of search success, satisfaction and difficulty—in connection with a number of user and translation task-related attributes. The former included the students' level of *translation expertise*, *web search expertise* and *source-text domain knowledge*, while the latter involved the *source-text types* and the *translation briefs* used in the study. I therefore designed a specific syllabus for an introductory course on scientific and technical translation with English and Spanish, which was offered in 2009 as part of a postgraduate degree in a translation studies within an English speaking environment.

#### **4.2 Research Approach, Methods and Data Collection Tools**

To carry out my web searching study I used grounded theory as my main research approach and case study research as the main method, in which various qualitative and quantitative sub-methods were combined for triangulation purposes. In particular, I employed direct observation using a screen recorder called “BB FlashBack” along with semi-structured interviewing and two questionnaires that were designed in and administered via SurveyMonkey—an application specifically developed to create online surveys (see [www.surveymonkey.com](http://www.surveymonkey.com) for details). The first questionnaire aimed at eliciting data on students' demographic characteristics (gender, age, academic qualifications and working languages) as well as data on their previous knowledge of and experience with both translation and web searching. The second questionnaire, which I refer to as “online search report” (OSR), adopted the form of a written report aimed at gathering information on students' (a) level of domain knowledge; (b) their web search tasks performed for translation problem solving; and (c) their perceptions of search success, search satisfaction and search difficulty.

The screen recorder was used to capture the translation students' processes of translating, Web searching and problem reporting carried out on the computers they worked with in class. Like keystroke-logging software, screen recorders such as Blueberry's BB FlashBack or TechSmith's Camtasia Studio record and create a time log of all the keystrokes, revisions, and editions (including changes, deletions and additions), keyboard shortcuts, cursor movements and mouse clicks made during the process of typing a text. Yet, unlike keystroke-logging programs, which only record writing operations carried out in their own text editors, screen recorders capture *any* screen activity carried out on a computer. Hence, these tools are considered “particularly useful for analyzing the research activities which form an integral part of translation processes, as they provide a detailed account of which electronic sources or

web-sites the subjects are using during translation” (Göpferich and Jääskeläinen 2009: 173).

Finally, following the principles and techniques of semi-structured interviewing, I conducted one-to-one interviews with the students to ask follow-up questions and gain more in-depth knowledge about my phenomena of interest. I used audio digital equipment to record the individual interviews, which were later transcribed and thematically coded (see 4.4 for more details).

### **4.3 Research Design**

As mentioned above, to explore students’ web search behaviours I designed a syllabus for an introductory course on scientific and technical translation with English and Spanish. The course, which lasted for twelve weeks during one semester and had four participants, provided the setting to collect the study’s research data. Except for semi-structured interviewing, all the data collection tools referred to above were tested in a pilot study that preceded the main study. The four students who decided to enrol in the introductory course on scientific and technical translation (all females in their mid-twenties, except for one student who was in her mid-thirties) declared English their L1.<sup>3</sup> Of these students, two were native speakers of English who considered Spanish their L2, one was a native speaker of Mandarin and a near-native speaker of English who also considered Spanish her L2, and one was a native speaker of Russian who considered Spanish her L3. They were all in their first semester of study, except for one of them, who was a second-semester student within the postgraduate translation programme. Overall, they had little experience in translation (both academically and professionally); hence their level of translation expertise was naturally low. The study’s research data shows that the students’ web search expertise was rather low as well.<sup>4</sup>

All four translation students participated in a total of four screen-recorded translation and web searching sessions that were carried out in class as part of the coursework (no assessment for teaching purposes was involved in these sessions). In each session, the students had to translate a different domain-specific source text (ST) from Spanish into English (they had access to personal computers as well as the internet and were instructed to use the web as needed to conduct their documentary research). These texts formed the main contexts, or embedding tasks, for information search and retrieval on the web. Students also had to complete an online search report in each session to specify their level of source-text domain knowledge and describe the web search tasks they performed for translation problem solving. Before the screen-recorded sessions took place, they were asked to fill in the online background questionnaire for a diagnostic overview of their knowledge of and experience with translation as well as web searching. The questionnaire also served as a consent form for research purposes.

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<sup>3</sup> At the institution where the study took place, students wanting to take a translation practice course in their respective language combination—which must necessarily include English—have to declare which is their first language and which their second language for translation purposes. The reason for this is that in most translation practice courses L1 translation and L2 translation are offered in an 80-to-20 proportion.

<sup>4</sup> I contrast to translation, no instruction on web searching was provided in class during the data collection phase of the study.



All four sessions produced a total of 16 screen recordings. Yet, one of the screen recordings obtained in the second session was corrupted and therefore none of the video files resulting from this session were used for data analysis. Furthermore, due to the wealth of information produced by the remaining twelve screen recordings as well as space restrictions, the results discussed in this paper only draw on a total of eight screen recordings. These correspond to sessions one and three of the main study (in the following referred to as Task 1 and Task 2), for which I selected two popular-science texts. The first text (232 words long) was an excerpt from a Greenpeace guide to genetically-modified food, which was of a rather broad nature and had an informative as well as an appellative function. The second text (177 words) was an excerpt from a press release by the Spanish National Research Council's (CSIC) on the discovery of two new enzymes that could possibly be used to treat AIDS. This text covered a specialized topic within the subject areas of chemistry and biology, and had an informative function.

The one-to-one interviews, finally, took place in my office during the final three weeks of the semester. These interviews followed a structured process in which I systematically analyzed previous information from earlier research stages.

#### **4.4 Data Processing and Analysis**

As part of the study's data processing, a co-evaluator and I evaluated (for the purpose of research) the translations produced by the students based on their problem-solving performance. We therefore developed a fixed number of categories to assess students' translation solutions according to their degree of successfulness. These solutions were thus classified as (a) unsuccessful, (b) partially successful, (c) successful or (d) highly successful (see Enríquez Raído 2011a: 214-219 for a discussion of the specific criteria used for this evaluation system). I also downloaded all completed background questionnaires and online search reports from SurveyMonkey.com and processed them in MS Word for subsequent coding in NVivo—a qualitative data analysis software that allows for the exploration of qualitative data sources, such as field notes, video and audio recordings, video and audio transcripts, etc. In addition, the screen recordings were transcribed by recording students' online actions on individual spreadsheets (one per participant and translation task) in which each online action was designated by a separate row of code. This transcription process is based on Hargittai's (2004: 213) "method for coding and classifying users' online information-seeking behavior", which "makes it possible to understand many details about users' sequence of actions simply by looking at the spreadsheet that contains the information" (ibid: 210). For Hargittai, an online action is "the mode of moving from one web page to the next" (ibid: 211). In my study, however, online actions involved not only said information-seeking movements but also other type of IS-related events as well as translating and problem reporting ones.

For the purpose of data analysis, I employed the three main analytic strategies used in Glaser and Strauss' grounded theory to analyze my qualitative data in NVivo. These are *coding*, *memoing* and *concept mapping*. Qualitative analyses were supported by descriptive statistics (namely counts, percentages and mean values) to process part of the data so as to provide a multi-faceted overview of the students' web search behaviours concerning their search needs, search goals, search processes and search

outcomes. More specifically, I counted their search needs based on the number of reported vs. unreported information needs as well as the number of individual vs. common needs. I also determined the frequency and distribution of common needs per student. As for the students' search goals, I counted these based on the number of comprehension goals, production goals and goals of a dual nature, and determined their distribution per student and common information need. I also examined the distribution of initial search actions per student, common information need and information goal(s). To account for the students' search processes, I adopted, from the web searching literature, a number of evaluation metrics that I modified to suit the needs of the study. These metrics concern two main levels of data analysis, namely the search session and the search query. The analysis of the search sessions involved their length, which was measured in minutes and seconds, and which was complemented by the number of online actions taken by the students to (potentially) satisfy their information needs. The total number of search sessions and online actions, as well as the search session lengths, were calculated per common information need and student. For the analysis of search queries, I adopted three different metrics. These are query complexity (determined in my study by the number of simple vs. advanced queries), query length (measured by the number of terms in a query, excluding articles, prepositions and punctuation) and query type (classified into initial queries and subsequent queries, with the latter being further classified into modified queries, repeat queries and unique queries). I examined the data on query complexity, length and type per student and common information need. Also in relation to the participants' search processes, I counted the number of direct address searches and browse searches per student and common information need. The same applies to the total number of web pages accessed. Finally, quantitative analyses of the participants' search outcomes included the distribution (per student and reported information need) of their adopted sources of information as well as of their degrees of search success, satisfaction and difficulty.

## 5. Discussion of Results

In the following, I will discuss the main findings of my study based on the type of interactions (or relationships) that I observed between the attributes of the study and the translation students' web search behaviours from a cognitive perspective (for a discussion of said behaviours from an affective perspective, see Enríquez Raído 2011a).

### 5.1 *Interactions between translation expertise and web searching*

Interactions between translation expertise and web search behaviours were most notably felt in connection with students' choice of online information sources. Overall, their choices were restricted by their lack of knowledge about and training in the use of translation resources, such as specialized dictionaries, glossaries, terminology databases and parallel texts. The students also lacked experience in the analysis of translation-related information needs; hence they frequently used the same information sources to address search needs of a different nature. This lack of distinction between various resources based on different types of information needs and goals seemed to result, in turn, in a rather highly iterative/repetitive type of online search behavior that was characterized by frequent repeat visits to the same site (primarily reference sites) and, in the case of the two non-native speakers of English, to repeat searches as well. While the

number of repeat visits to the same Website “tells us something about Website loyalty and satisfaction” (Nicholas et al. 2006: 215), the number of repeat searches “may indicate the fact that a user has not found all that they wanted the first time around” (ibid: 225).

Nevertheless, a closer look at task-related factors—in particular the degree of specialization—suggests that increased task complexity (along with increased translation experience) had an impact on students’ choice of information sources. While in Task 1 the students frequently or entirely limited their online searches to either a regular bilingual dictionary or a Spanish monolingual dictionary,<sup>5</sup> in Task 2 the students’ use of information sources increased, thus involving slightly more variation than in Task 1. That is, the students’ range of search behaviour was wider in Task 2 than in Task 1. In particular, there was a slight increase in the range of dictionaries as well as a shift towards encyclopedic information sources (namely Wikipedia).<sup>6</sup> In the case of one of the two native speakers of English, a move towards the use of parallel texts could be observed as well. Most likely, it was the broader nature of Task 1 that led the students in my study to search primarily for linguistic information (which would explain the dominant use of dictionaries). The exception here is, again, the non-native speaker of English with the most recent translation training experience, who also searched for extra-linguistic information, i.e. thematic and cultural content. In contrast, the more specialized nature of Task 2 as well as a better understanding of the translation process seemed to lead the students to seek, to a lesser or greater extent, both linguistic and extra-linguistic information (as illustrated by the shift towards the use of Wikipedia and, in some cases, parallel texts).

Other interactions between translation expertise and web search behaviours were observed with regard to the students’ search styles, particularly in terms of their engagement with web content. In Task 1 the students were mostly interested in retrieving equivalents as opposed to acquiring background knowledge as well. They generally displayed a typically shallow online search style that was characterized by checking and comparing, and that mainly resulted from a desire for fast and easy access to information. Nevertheless, the non-native speaker of English referred to above also searched for background information and read content to address some of her thematic needs. This resulted in a more interactionistic style of online searching—i.e. one characterized by a higher engagement with or consumption of selected web content—than the other students. In Task 2, where the average session lengths generally increased for most information needs (except for the least technical ones), the students’ searching styles continued to be primarily motivated by their desire for fast and easy access to equivalents. Here, however, the English native speaker mentioned above showed a different searching style, also interacting with the web content she accessed to address some of her thematic needs. To do so, she performed Google searches for which she used source-text keywords as lexical filters to construct simple, yet rather long query

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<sup>5</sup> The only exception here was one of the two non-native speakers of English (who had the most recent translation training experience of all four students), who combined the use of a single dictionary with selected encyclopedic information and several parallel texts.

<sup>6</sup> Although the students sometimes used Wikipedia for acquiring extra-linguistic knowledge, they also used this resource as a kind of bilingual dictionary, often switching between the Spanish and English versions of the article retrieved. In contrast, the professional translators in Désilets’ (2010) study never used Wikipedia to find a solution to a terminology problem. They only consulted this resource to obtain background information on a specific concept on a few occasions.

statements. This helped her constrain the body of search results to documents dealing with these terms and, oftentimes, with the same topic as the source text. In my opinion, this online search evolution can be attributed to a learning effect, i.e. to her better understanding of the translation process.

### ***5.2 Interactions between translation task-related factors and web searching***

Based on the tentative results discussed above, one could argue that task-related factors appeared to have had a bigger impact on students' range of search behaviours (which significantly increased in Task 2 for all four students) than on their depth of research (where only the research conducted by the two students referred to above was notably deeper). The total number of pages accessed in each task supports the fact that students' range of search behaviour was wider in Task 2 than in Task 1. While they accessed relatively few pages in Task 1 (an average of 2.63 pages per search need), in Task 2 they accessed an average of 7.05 pages per information need. Subsequently, the average number of pages that each student accessed to address all of their search needs was considerably higher in Task 2 (33.5 pages per student participant) than in Task 1 (10.5 pages). This significant increase in numbers can be attributed, once again, to differences in topics and degree of specialization. This is in line, for example, with Byström, who states that a common finding in information seeking studies "is that task complexity (considered on a job level) increases the use of information sources [...] regardless of the type of source," which suggests that "there is more information processing involved in more complex work" (2002: 582).<sup>7</sup> Furthermore, in her study of information sources of varying task complexity, Byström found that "the acquisition of certain information types in connection to different levels of perceived task complexity reveals that the increase of task complexity leads to the need for more information types" (ibid: 589). She also observed that "the more complex the task and the more information types involved during task performance, the higher the number of information sources used" (ibid.). In addition to these aspects, in my study a *higher* awareness on the part of the students of the complexity of translation could also help explain their broader and more intensive use of (different) sources of information in Task 2.

Task-related factors also seemed to have had an impact on the participants' choice of initial search action or first step in a search process, which may involve subsequent steps. The findings obtained show that in Task 1 there was little or no variation in initial search actions across the students as they chose to initiate all or almost all of their searches using direct addresses (which involve typing the URL of a known resource) regardless of the type of information needed. In other words, the students started their searches from 'the known'. In Task 2, however, their choice of initial search actions was wider than in Task 1 and involved a combination of direct address searches (to access reference sites) and search engine queries. This could be explained by the fact that the second text included more specialized terms and cultural elements than the first text, for which some of the students seemed to consider research in regular dictionaries

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<sup>7</sup> In my study, the increase in the overall completion time for each task was another indicator of the increased level of complexity and information processing required in Task 2. The students' average completion time for the first task was 69 minutes and 16 seconds, while their average completion time for the second task was 95 minutes and 37 seconds. As text 2 was shorter than text 1, the increase in total time for each student could in fact be taken as an indicator of increased task complexity.

to be unsuitable. Consequently, they shifted some of their initial search actions from fact-based resources (i.e. reference works) to more open-ended searches in Google.

The fact that the students frequently initiated their searches by directly accessing known (reference) sites is somewhat consistent with the findings of previous web searching studies, which show that known sites are important for regular searchers. White and Iivonen, for example, state that users have been found to “start their searches from known sites and visit known sites many times during their searches [...] or over time” (2001: 723). This is also true for the students in my study, who resorted to known sites (mostly dictionary sites) not only at the beginning of their searches but also during their search processes in both tasks. Furthermore, as a general pattern (especially in Task 1), the students typically carried out search engine queries only when their dictionary searches failed to provide them with satisfactory answers. This seems to be true for some professional translators as well. White, Matteson and Abels, for example, found in their focus group study that “when the dictionaries do not provide acceptable answers, the translators move beyond them to different types of resources” (2008: 591). Strong reliance on dictionaries as a primary source of consultation is perhaps not that surprising given that, as Palomares Perraut and Pinto Molina point out, “las fuentes terminológicas y lexicográficas son las más necesitadas y utilizadas por los traductores” (2000: 111).

### ***5.3 Interactions between web search expertise and web searching***

Interactions between students’ web search expertise and their web search behaviours were most notably felt in connection with their query construction and modification skills to locate relevant information on the web. Here, my findings suggest that different levels of web search expertise correlate with the effectiveness with which query statements are expressed and refined. The students in my study, who had little online search expertise, favoured simple queries, sometimes using natural language in their queries and frequently over- or under-specifying their search requests. When they did not find satisfactory results, they sometimes replaced, added, or subtracted terms, but rarely made use of search operators and/or query modifiers for query refinement, except for some phrase searches. At other times, they tried new search paths or gave up their searches altogether. Furthermore, they generally used few query terms in their pursuit of relevant results—searches averaged 2.44 terms per simple query in Task 1 and 2.38 terms in Task 2—and typically accessed one of the first three (in some cases five) results displayed on the search results page. The students’ rather simple query behaviour appeared, in turn, to reflect their misconceptions about how search engines work, above all, by showing considerable trust in these tools (more specifically in Google).

These results seem to be more or less in line with those obtained in other web searching studies, which have found that “users prefer rather simple search statements and do not plan their searches” (White and Iivonen 2001: 724). Web searchers have also been found to use relatively few query terms—generally two or three keywords per search (KeywordDiscovery.com 2010; Batelle 2006; Jansen, Spink and Saracevic 2000)—rarely construct complex/advanced queries (Jansen, Spink and Saracevic 2000) and “easily modify their query statements, give up the old ones, and try new ones” (White and Iivonen 2001: 724). Jansen, Spink and Saracevic (2000) also found that the average number of pages accessed by users is 2.35 and that most searchers do not access any results past the first results page (*ibid.*). Based on these findings, one could hypothesize

that the typical profile of a regular searcher involves shallow searching, which, at first, may suggest “an unsuccessful, uninformed, or lazy form of behavior” (Nicholas et al. 2006: 210). Yet, for the students of my study, this type of online search behaviour was often successful to retrieve translation equivalents, mainly by using the web as a type of metadictionary and, on occasions, as a parallel, aligned corpus. Shallow searching was not always successful, however, for retrieving relevant background information on the web that could be used for translation problem solving. Here, the use of the web as a parallel corpus would prove more useful, thus coming closer to best work practices concerning the web search behaviour of professional translators.<sup>8</sup>

#### **5.4 Interactions between domain knowledge and web searching**

Previous web searching studies, such as the one conducted by Hsieh-Yee (1993), have shown that users’ levels of search experience and domain knowledge affect their selection of search terms. Spink and Saracevic (1997) found that the search terms from a user’s domain knowledge as well as those from the system’s output are the most successful terms for retrieving relevant content. In my study, source-text domain knowledge (i.e. the remaining user attribute) did not seem to have a particular bearing on the participants’ selection of query terms as these were mostly determined by the source texts themselves. Nevertheless, both source-text domain knowledge and task-related factors appeared to have had a combined effect on the students’ amount and type of information needs.

In general, it was possible to observe that the higher the level of *perceived* domain knowledge, the lower the number of information needs and the less specialized the nature of these needs. Furthermore, both the type of research and the amount of time spent online seemed to have had an impact on translation quality. For example, the two students referred to above who conducted both linguistic and extra-linguistic research, experienced the highest increase in research time compared to Task 1 (13% and 20%) and produced better quality translations than the remaining two students, who primarily conducted linguistic research and experienced the lowest increase in research time (3% and 8%). These results seem to be in line with previous findings (e.g. Krings 1988; Gerloff 1988; Jääskeläinen 1990) that suggest that translation quality is related to the amount of time and effort invested in translation processing—of which documentary research is an essential part.

### **6. Implications for Translator Training**

One of the most significant implications of my study for translator training relates to the importance of teaching translation students—early on in the curriculum—(a) the diversity of (online) resources available for translation and (b) how to select adequate

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<sup>8</sup> The professional translators in Désilets’ study, for instance, were found to use Google “to mine the web-as-a-corpus” by searching “bilingual sites for solutions [and] assessing usage in target language of particular solutions” (2010: n.p.). The most experienced professional translator in my pilot study also displayed this type of behaviour. Like the five professional translators interviewed in Désilets, Barrière and Qurion’s (2007) study, he spent considerable time in evaluating and analysing search results from Google to be able to obtain a picture of the different types of translation information found and their respective contexts of usage and quality.

resources based on different types of problems, or information needs. As indicated earlier, the students in my study typically used reference sites (mostly dictionaries) as their first port of call in searching for both linguistic and thematic (specialized) information, i.e. they did not always base their selection of specific information sources on specific types of information needs. And although in Task 2 the range of information sources generally increased, with students showing a greater awareness of the appropriateness of specific resources for specific information needs, reference works continued to be the most dominant resource type.

The results of the study also show that the students sometimes used general online bilingual dictionaries to try and find “non-dictionary type of information” (Varantola 1998: 189) such as acronyms, allosemantic words and collocations.<sup>9</sup> Furthermore, the analysis of unsuccessful solutions resulting from the consultation of online dictionaries suggests that polysemous words caused particular difficulty to the novice students of this study. Here, it is often the abundance of choice in dictionary entries that causes users to select inappropriate solutions. Translator training would therefore benefit from emphasizing more strongly the need to cross-check dictionary search results, both within the dictionary accessed itself and within selected parallel texts. In my web searching study, documentary research involving the use of both reference works and parallel texts led to the most successful translation solutions among the students. Given that translators typically face a wide range of problems such as terminological, phraseological, cultural and domain-specific problems—for which no single resource offers solutions to all of them—<sup>10</sup> a battery of resources and tools is in fact needed for translation problem solving.

Overall, the findings of my study seem to highlight the need for formal training in the use of appropriate resources based on question analysis (i.e. information needs analysis), an aspect also supported by Massey and Ehrensberger-Dow’s (forthcoming) pilot study. Here, particular attention would ideally need to be paid to the more or less open (i.e. non-factual), or closed (i.e. factual) nature of information needs (or questions asked) as well as the predictability of sources of information for providing suitable answers. As White and Iivonen point out, these two question characteristics may have an impact on users’ choice about their initial “Web search strategy”, which, in turn, “has implications for the continuation of the search” (2001: 722-723). The results of my study seem to support this claim. Comparing the initial search actions of Task 2 (for which some of the students searched both for linguistic and extra-linguistic information) with those of Task 1 (for which most students sought linguistic information only), a major shift away from direct address searches was identified. While in Task 1 almost three quarters (74.6%) of all initial search actions involved the use of direct addresses to visit known dictionary sites, this number fell to 50% for Task 2. Instead, for Task 2, the four students carried out 48.15% of their combined initial search actions in the form of search engine queries. This could be explained by the fact that the text for this task included more specialized terms and cultural elements than Task 1, for which some of

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<sup>9</sup> While this type of information can be most likely found in both print and electronic dictionaries nowadays, one wonders whether the same can be said for free online dictionaries of a less authoritative nature.

<sup>10</sup> Désilets, Barrière and Quirion suggest that a “wiki translation resource, that is, a free, open, massively collaborative wiki based resource ... may help improve on the myriad of online resources currently used by translators ... by providing a single free tool with a wider coverage of all types of translation problems and topic domain” (2007: n.p).

the students seemed to consider research in regular dictionaries to be unsuitable. Consequently, they shifted some of their initial search actions from fact-based resources (i.e. reference works) to more open-ended searches in Google.

Nevertheless, as briefly indicated above, students' abilities to transform questions into appropriate query statements were not always successful, mainly as a result of their lack of understanding of search engine features as well as the lack of planning searches according to specific information goals. Given that the keyword search approach to information seeking and retrieval is considered the most powerful method to finding information on the web, the sooner students are exposed to the features of various search engines (and metasearch engines) the better. The findings of this study point to two particular training needs in this area: (a) knowledge about search engine performance for data retrieval as opposed to information retrieval (see Enríquez Raído 2011a: 270-279 for details), and (b) knowledge about search engine features to efficiently construct queries for finding relevant information on the web. Furthermore, considering translators' extensive use of the web as an external resource for seeking both linguistic and extra-linguistic information, student translators would most likely benefit from developing web searching skills that go beyond a mere shallow searching and that are closer to an expert, interactionistic and deep searching style.

Finally, and with regard to all of the above, it would be essential to develop learning materials that enable students to learn how to learn, which is, after all, the ultimate goal of the overall notion of information literacy. One possible application of the findings of my study would be the development of an information-search model for translator training. Such a model, which would encourage students to plan their searches according to different information needs as well as to use the web critically, could, for example, be based on White and Iivonen's two question characteristics mentioned above, i.e. on the open/closed nature of questions and the predictability of sources of information for providing suitable answers. Given the space constraints and the different focus of this article, readers are referred to a forthcoming publication on this specific aspect of my research (cf. Enríquez Raído 2011b).

## 7. Conclusion

In this paper I have argued that despite the important role that information skills play in translator training, much research still remains to be carried out to gain a better understanding of the (online) information behaviour of (student) translators in order to improve training opportunities in this area. One obvious way of reducing this gap is to foster research through studies like mine, which become more useful when they can be and *are* transferred to other research settings. Pooling research data from various studies in a dedicated database (cf. Göpferich 2010) would allow, for example, for cross-institutional research as well as the comparison of several data sets.

Another aspect that in my opinion is worth studying in the future is the didactic potential of the research tools themselves. That potential has been indicated in a study carried out by Pym (2009), in which students' first had their translation process recorded and then watched said process on screen, an exercise that raised students' meta-cognitive levels of awareness, inviting and enabling them to critically reflect on their working styles. Similarly, in my own study, the OSRs were very positively



received by the students for their didactic merits as they felt encouraged to reflect more thoroughly and more critically about the nature of the problems they faced, the decisions they needed to take and the options they were presented with. As such, the OSRs became tools supporting the constant decision making processes involved in translation. The students also praised the usefulness of the OSRs for supporting their web searching processes, especially when it came to evaluating the content found on the web.

In short, as we learn more about the information behaviour of (translation) students, “we will”, as Massey and Ehrensberger-Dow’s (forthcoming) state, “be able to offer focused information literacy training for a range of specific target groups”.

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