

# Lessons from students: A pilot project to discover guidelines for creating a student-friendly, relation-rich term bank

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## Abstract

Since the 1990s, there has been growing interest in two key types of terminological information: terminological relations (including generic-specific and part-whole, as well as various non-hierarchical relations), and terminological contexts. These come together in knowledge-rich contexts (KRCs), which both illustrate terms' behaviour in texts and reveal important connections between terms and between concepts. Such information has been integrated into prototype resources for translators, technical writers, subject-field specialists and students. As more resources integrating this information are developed, we must evaluate how to present it effectively for key user groups. In this paper, we will report on a small pilot project carried out with translation students translating between English and French. The students translated excerpts of popularized texts on breast cancer, using the CREATerminal (a terminology resource model that includes English and French KRCs describing four terminological relations), and compared the information this resource provided with that on term records in TERMIUM<sup>®</sup> Plus and the *Grand dictionnaire terminologique* (GDT). We report students' evaluations of the three resources and attempt to derive some guidelines for developing student-friendly, relation-enriched terminology resources.

## 1 Introduction

Although perspectives and terminology used may differ, the importance of terminological relations in terminology research and management is appreciated by many scholars. Attention has focused at various points on the classification and description of relations that are relevant for terminology work, on methods for extracting

these from texts, and on the relevance of and approaches to integrating this information into terminology resources. Among the first proposals for relation-enriched terminology resources was Meyer et al.'s (1992) *terminological knowledge base* (TKB), a terminology resource that describes not only a range of concepts but also a variety of relationships that hold between them.

These relations can be identified manually or even (semi-)automatically from texts (cf. L'Homme and Marshman 2006) in the form of *knowledge-rich contexts* (KRCs) (Meyer 2001). These excerpts of texts often contain *knowledge patterns*—i.e., combinations of terms or other linguistic units that express concepts, linked by lexical markers of the relations between them—and can both provide information to assist in understanding the terms and concepts and illustrate the linguistic items in use. As excerpts of “authentic” texts, KRCs can also illustrate variation in concepts' expression and the lexical markers used in various communicative situations (e.g. Condamines 2002, 2008; Marshman and L'Homme 2008; Marshman et al. 2009).

In Meyer et al.'s footsteps followed researchers who have investigated various strategies for developing and populating TKBs (e.g. Condamines and Rebeyrolle 2000, 2001; Faber et al. 2011; Faber and San Martín 2011; León et al. 2011, 2013) in a selection of domains. Some projects have addressed the use of terminological relationships in the form of ontologies (e.g. Cabré et al. 2004; Gillam et al. 2005; Maroto and Alcina 2009), as part of an increasing movement towards the integration of terminology and ontology (e.g. Temmerman and Kerremans 2003; cf. also Roche et al. 2011). Still others (e.g. L'Homme 2013, 2013a) have described lexical relationships between terms. Most of these resources have been in electronic form, although some specialized print dictionaries (e.g. Dancette and Réthoré 2000) have included such information.

While relations are being increasingly prioritized in resources, there is still no standard model for relation choice and representation. This may be true in part because the wide variety of users of terminology resources and purposes for their use (e.g. Sager 1990) entails diverse needs in this area. Faber and San Martín (2011: 48) express the need for “customized” design of terminology resources:

*[I]n order for any knowledge resource to aspire to psychological and explanatory adequacy, its underlying conceptualization and design must be in consonance with the needs and expectations of a specific user group, whose main objective is generally to acquire knowledge about the specialized area.*

In some contexts, even this highly relevant observation can be questioned: translators (who are seen as the primary users of terminology databases in contexts such as Canada’s) may not be as interested in domain knowledge per se as in terms, equivalents, synonyms and their use (including the contexts in which they occur). These and similar observations have led some to conclude that conventional terminology resources such as the large term banks, including TERMIUM® Plus<sup>1</sup> and the *Grand dictionnaire terminologique* (GDT)<sup>2</sup>, are not adequate for translators’ needs. The same can be said for other resources: ontology-based resources may also not be easy to understand and use for non-subject-field specialists such as translators and terminologists (Cabré et al. 2004: 87).

It is thus important to examine and discuss some of the resources that are available to specific groups and how (and how well) they meet the needs of these groups. In this paper, we will focus on the needs of trainee translators: individuals who are likely in need of both subject-field and linguistic knowledge to carry out a translation task, but may attribute different levels of importance to each kind of knowledge, and may evaluate the resources that supply this knowledge differently from other groups and from one another. We will gather information about trainee translators’ reactions to resources from a questionnaire completed by users of three terminology resources, and try to extrapolate some guidelines for the creation of effective resources based on this feedback.

We will begin with a brief overview of some of the currently available terminology resources (section 2). We will outline the methodology

used to gather information for this pilot study (section 3), and then will present and discuss some findings (section 4), before wrapping up with some brief remarks, suggested guidelines derived from the observations, and ideas for future work (section 5).

## 2 Approaches in terminology resources

In this section, we will provide a brief overview of the conventional term banks used in the project (2.1), as well as a few examples of relation-enriched resources and how they have complemented this basic model with terminological relations (2.2), and then describe the CREATerminal prototype used in this study (2.3).

### 2.1 Conventional term banks

The largest and most widely used term banks today are mainly constructed on traditional models such as those described by Pavel and Nolet (2001) and Dubuc (2002), and provide a range of information to translators, students, writers and other users.

The Government of Canada’s TERMIUM® Plus term bank (Government of Canada 2013; see also Pavel and Nolet 2001) has very broad coverage, including over four million terms (most in English and French, but with a growing component of Spanish and Portuguese) from a wide range of domains. In addition to administrative information including dates of modification and record authors, its term records contain largely standard term record fields of domain and sub-domain, terms, equivalents, sources, part-of-speech labels, usage labels, definitions, contexts, observations and in some cases phraseologisms (although not all of these fields may appear on each record).

After a significant “facelift” in the last two years, the GDT now presents terms (mainly French and English, with a small complement of other languages) from a wide range of domains in a term record format that calls particular attention to French terms and to the associated usage information (particularly appropriateness for use in Quebec). In addition to (mostly French) definitions, some records include illustrations and notes to clarify meaning (including distinctions between related terms and concepts) and usage, as well as administrative fields.

Coverage of terminological relations in these resources is uneven, with any such information

<sup>1</sup> <http://www.termiumplus.com>

<sup>2</sup> <http://www.granddictionnaire.com>

generally found in definitions, contexts or observations/notes.

## 2.2 Enriching terminology resources with relations

In filling the gaps in this traditional term record model and developing the idea of TKBs or ontologies, a number of projects have addressed the needs of users for additional relation information. Meyer et al.'s (1992) COGNITERM project was followed by other projects including *GenomaKB*<sup>3</sup> (Cabr e et al. 2004; Feliu et al. 2004) that integrated corpora and bibliographical information with a terminological database and an ontology to provide an integrated, multilingual resource that would meet the needs of non-subject-field specialists in the field of the genome. This type of integration reflects some of the observations of Bowker (2011), which highlighted the usefulness of access to corpus data for translators researching terms.

Similar attention has been paid to the importance of context of use and its potential for disambiguation in the description of terms and terminological relationships in the *EcoLexicon*<sup>4</sup> project (Faber et al. 2011; Le on et al. 2011, 2013). This multilingual resource in the field of environmental science provides access not only to definitions of concepts, but also to visual information in the form of both illustrations and dynamic relation maps that illustrate connections between terms and other elements (including generic-specific, part-whole and various non-hierarchical relations) based on an approach inspired by Fillmore's Frame Semantics (Faber et al. 2011; Faber and San Mart n 2011). The dynamic visualization options allow the user to view a wide range of connections and to navigate by following links between concepts, in order to better understand their complex interconnections.

Another set of resources, including the *DiCoInfo*<sup>5</sup> and the *DiCoEnviro*<sup>6</sup>, has been created by a team headed by Marie-Claude L'Homme at the Universit  de Montr al's Observatoire de linguistique Sens-Texte. Developed based on corpus data from the perspective of lexico-semantic terminology, and calling upon principles of Explanatory and Combinatorial Lexicography (Mel uk et al. 1995; L'Homme 2012) and

later on Frame Semantics, these resources provide extensive descriptions of links between terms (including nouns, verbs, adjectives and phrases) in the fields of computing and the Internet and of the environment, respectively. In addition to part-of-speech labels, equivalents, contexts and definitions, terms are accompanied by an analysis of their actantial structures and typical actants, as well as a list of terminological relationships that may include synonyms, antonyms, hyponyms, hypernyms, meronyms, and holonyms, as well as a number of "custom" relations observed in the corpora. A visual interface, the *DiCoInfo visuel* (Robichaud 2012) allows users to view connections between the terms described in the *DiCoInfo*.

This small sample of resources reflects the potential for explicitly describing a wide variety of relationships relevant in terminology, as well as a range of options for making this information easily accessible to users, including increased access to a variety of contexts and options for various approaches to navigation within the resource, including a visual interface.

## 2.3 The CREATerminal prototype

Another in the list of relation-rich resources, but far less developed than those described above, is the CREATerminal prototype. In development since 2007, it aims to provide a useful resource for translators, built based on the content of popularized, bilingual (English-French) documents in the field of breast cancer (e.g. Marshman and Van Bolderen 2009; Marshman, Gari py and Harms 2012). The information contained in the CREATerminal prototype was extracted from bilingual Canadian web sites (e.g. Health Canada, the Canadian Cancer Society, and the Canadian Breast Cancer Foundation).

The CREATerminal is a Microsoft Access database with three main tables: one has an entry for each of the approximately 85 concepts covered in the resource, and links the terms identified for each concept with their equivalents in the other language; one includes approximately 250 bilingual contexts showing the terms and their equivalents in use, and the third presents a total of approximately 800 bilingual KRCs that illustrate terminological relations (generic-specific, part-whole, cause-effect and entity-function) that involve the concepts and include lexical relation markers. These KRCs are anno-

<sup>3</sup> <http://brangaene.upf.es:8080/genoma/index.jsp>

<sup>4</sup> <http://ecolexicon.ugr.es/en/index.htm>

<sup>5</sup> <http://olst.ling.umontreal.ca/cgi-bin/dicoinfo/search.cgi>

<sup>6</sup> <http://olst.ling.umontreal.ca/cgi-bin/dicoenviro/search.cgi>

tated to identify the relationship present, the relation marker, the related items, and their sources.

Users can browse term records from the term record form—which shows terms and equivalents, and offers buttons to display examples and KRCs illustrating different relations—or view complete lists of KRCs for each relation type or lexical relation markers for the relations.

The database can also be searched using generic queries that allow the user to search for specific character strings in term records, examples and KRCs.

### 3 Methodology

This pilot project focuses on the comparison of the CREATerminal, TERMIUM<sup>®</sup> Plus and the GDT by a sample of students in translation programs (B.A. and graduate programs) at the University of Ottawa. These students were predominantly Anglophone and registered in courses that included a component of terminology and/or terminography. The students were first introduced to the concept and relevance of relations in the field of terminology in their courses and with an introductory in-class exercise, and to the CREATerminal model and how to consult and search it. (All had previously used both TERMIUM<sup>®</sup> Plus and the GDT in their coursework and were assumed to be comfortable with their use.) They were then asked to carry out a translation task and invited to complete an optional, anonymous online questionnaire summarizing their experiences after class.

The task involved translating a selection of short (1-3 sentence) excerpts of popularized texts on breast cancer. A mix of English to French and French to English translation was offered, and students were asked to try both (so that they would be translating both into and out of their L2). Students were asked to pay particular attention to highlighted terms in the excerpts and to look them up in the three terminological resources. All concepts corresponding to the highlighted terms were described in at least two of the terminology resources used in the comparison, although occasionally term forms or terms themselves varied.

Students were asked to translate as many excerpts as possible in a thirty-minute period. They then were invited to complete the questionnaire, delivered via the Survey Monkey interface. The first section of the questionnaire gathered general information on the respondents' perceptions of

several subjects: the resources' usefulness for understanding concepts in the excerpts and for writing about them; what the respondents found most and least useful about each resource; and which resources they would use again for a similar task. The second section (on a new page) addressed terminological relations specifically, and asked about students' perceptions of how well terminological relations were described in each resource, as well as how useful the information about terminological relations in general was for understanding concepts and for writing about them. Respondents were also asked to evaluate the usefulness of individual record fields containing this relation-related information. Finally, the third section asked students to identify which fields they would consider useful in their own translation-oriented term records (i.e. whether they currently included them, planned to include them, would consider including them, or did not and would not include them).

Multiple-choice questions were scored on a rating scale from 1 to 4, with 1 representing a negative evaluation (e.g. "not at all useful" for questions about usefulness, and "do not and will not include" for questions about term record fields) and 4 representing a positive evaluation (e.g. "very useful", "currently include"). Average scores were computed automatically by Survey Monkey based on these scales.

Where applicable, a "don't know" or "did not consult/use" option was provided. Participants were also offered the option to list and evaluate additional resources they consulted.

In total, 24 respondents consented to participate in the survey. A very high dropout rate of almost 50% after the first question suggests that many may have first accessed the questionnaire to familiarize themselves with its contents (as the main questions could only be accessed after consenting to participate), and either returned later to complete it or were dissuaded by the nature or length of the questionnaire. Of the 13 respondents who continued to the second question, 7 continued to the final question.

#### 3.1 Some limitations of the methodology

An important limitation of this study is the small sample size and the high dropout rate. Important ethical considerations involved in the collection of data from students required great care to avoid coercion and ensure anonymity, which unfortunately limited opportunities to encourage partici-

pation and follow up with potential respondents (in addition to imposing significant restrictions on the general methodology). Moreover, the nature of the sample itself should be taken into account, as it consists of students from a single academic setting, and those most likely to participate were doubtless those who had a particular interest in terminology in general and terminological relations in particular.

The range of term records consulted was also necessarily restricted by time limitations and coverage limitations for the three banks, and the approach used to introduce variety by giving a choice of excerpts to translate (coupled with the survey-based methodology) also made it impossible to verify exactly which term records in each resource were consulted by each individual.

The limitations inherent in the use of a purely survey-based methodology for data collection are also significant in themselves. We accessed only respondents' perceptions of their experience, and thus were not able to objectively measure aspects of this experience, or to provide a fine-grained portrait of how the various resources were actually used.

It is therefore essential that these data be taken as purely indicative clues to help in identifying key concerns in creating student-friendly, relation-rich terminology resources (and certainly not as evaluations of the quality of any specific resource). Given the limitations of the sample, no statistical evaluation of the data will be carried out beyond the comparison of average scores from multiple-choice questions and percentages of respondents within the group.

#### 4 Findings and discussion

In the first section of the questionnaire, respondents were asked to evaluate and compare the usefulness of the three resources for two main tasks: understanding concepts (i.e. decoding the source text) and writing about concepts (i.e. encoding the target text).

In the average overall evaluation of the usefulness of the three resources, the 13 respondents found all of the resources to be between "fairly useful" and "very useful" for understanding concepts: TERMIUM<sup>®</sup> Plus had the highest average score of 3.46 out of 4, followed by the GDT at 3.17 and finally the CREATerminal at 3.00. For writing about concepts, the scores showed a wider range and fell just slightly below "fairly useful" into the range of "somewhat useful". In contrast

to the previous ranking, the CREATerminal scored highest, with an average score of 3.36, followed by TERMIUM<sup>®</sup> Plus with an average score of 2.92 and finally the GDT at 2.73.

The very different ranking of the resources for the two purposes most likely reflects the strengths of different types of data. Among the chief complaints were some gaps in information (e.g. of definitions, contexts and cooccurrences in TERMIUM<sup>®</sup> Plus and the GDT), and problems with searching and display in all three resources (e.g. having to scroll down or through various records to find the relevant one in TERMIUM<sup>®</sup> Plus and the GDT, or having to work with one query at a time and to close tabs between searches in the CREATerminal).

On the positive side, and unsurprisingly, in each resource the coverage and variety of equivalents included were valued. Among the strengths of TERMIUM<sup>®</sup> Plus, respondents cited broad coverage of terms and concepts and inclusion of bilingual information—both likely to assist with understanding—as well as ease of use and precise searching. The GDT's strengths, as identified by the students, included the notes provided about usage, origin, etc. These might fulfill a decoding or an encoding function. Finally, the numerous, bilingual KRCs in the CREATerminal seemed most helpful for writing about concepts.

We can thus observe that students value both the defining and the illustrating functions of terminology resources. This may represent an exception to the general observation that translators tend to be most concerned with equivalents and less with definitions, perhaps because these are students working in a largely unfamiliar field—or because they were asked specifically about the understanding of concepts.

On a related point, in the third section of the questionnaire, 4 of the 7 respondents reported currently storing definitions on their term records, and 2 of the others reported planning to include them (an overall score of 3.43). In contrast, none of the students reported currently storing relation-related fields, although between 3 and 5 of the respondents (depending on the field) indicated that they would consider including them. The students seemed more likely to consider including conventional term record fields (ranging from a score of 2.5 for phraseologisms to 3.29 for contexts and 3.43 for definitions) than relation-related fields (ranging from 1.5 for

sources of terminological relations to 2.33 for a context illustrating the relationships).

In the second section of the questionnaire, when asked about the usefulness of the different types of relations described in the CREATERminal, the 9 respondents indicated that they were useful to varying degrees, with the highest average score (3.5 out of 4) for the generic-specific relation, followed by part-whole (3.2), entity-function (3.0) and finally cause-effect (2.8). When asked about specific elements of the annotated KRCs that were helpful for understanding the concepts (excluding the terms themselves), the highest-ranked fields were the example source (with an average of 3.2) and the French example (3.17). The other fields, except for the French relation marker (2.67), scored 3.0, indicating that these elements were considered fairly useful. For writing about concepts, the English context explaining the relation was on average ranked most useful (3.75), followed by the English lexical relation marker (3.5), the French context (3.2) and the English related term/item (3.0). All other fields scored below 3.0. The average score from 10 responses to the final question from the section indicated that the CREATERminal provided the most useful information about terminological relations (with a score of 3.56 out of 4), followed by the GDT at 2.88 and finally TERMIUM<sup>®</sup> Plus at 2.56.

This provides an interesting contrast to the observations above, in that information about terminological relations appears to be useful, but not very likely to be stored by students in their own records (perhaps because of the complexity and labour-intensiveness of the task) and also unlikely to be thoroughly covered in conventional terminology resources. We thus see the need for “third-party” terminology resources that do integrate this information to fill the gap for trainee translators (and those with similar needs).

This need is reflected somewhat in the reactions of users when asked which resources they would use for a similar task again. Of the 12 respondents to this question, 83% indicated that they would use TERMIUM<sup>®</sup> Plus, 67% would use the CREATERminal, and 50% would use the GDT. (It should nevertheless be noted that the respondents were mostly Anglophone and that the data suggest that they were paying particular attention to information for encoding in English, which is not the primary purpose of the GDT.)

## 5 Conclusion

This study has elicited some encouraging reactions from students, indicating that relation-enriched resources can meet some perceived needs in carrying out a translation task. From the literature and findings described above, we can observe a high priority accorded to equivalents (which is not surprising) and to the understanding of concepts (e.g. via definitions and KRCs). This may well reflect the nature of the students’ experience, in their need to interpret concepts that are almost inevitably unfamiliar (and challenging given the fact that the translations were of excerpts and not whole texts, which would provide more information to help with interpretation). There is also a positive evaluation of the usefulness of relation-related information—particularly for writing—as evidenced by the evaluation of the CREATERminal resource and the willingness to use it again.

Although this data is admittedly very limited, we can derive some preliminary, suggested guidelines for the creation of a relation-rich terminology resource that would meet the expectations of the students:

Guideline 1: Maximize user-friendliness. Students’ reactions suggest that for this user group, the user-friendliness of resources is fundamental. Regardless of resources’ content (and coverage was highly valued by the respondents), it seems that easy access to this information may be equally important. The inclusion of visual interfaces such as in the *EcoLexicon* and the *Di-CoInfo visuel*—particularly if these are smoothly integrated into an interface that also allows for easy consultation of textual material—are promising avenues for future development.

Guideline 2: Integrate numerous KRCs. The students did find the relation information they consulted helpful, and seemed to be particularly drawn to it in the form of KRCs. This may be due to a focus on information that can be useful for writing about concepts as well as understanding them. In any case, to satisfy the needs of this user group, it seems beneficial to include as wide a range of KRCs as possible (or practical) to take advantage of the dual function of these items (while nevertheless maintaining efficient integration and organization of the material to ensure easy navigation). Despite the time investment, advantages to including selected KRCs in a resource rather than offering (only) direct access to corpus data may include both speed and ease of

access to information—particularly for users who are new to the subject field in question and may need assistance for the first stages of research—as well as the ability to exploit the data they contain, e.g. for visual representation of relevant relationships.

Guideline 3: Include parallel, bilingual information where available. A bilingual format is common to TERMIUM (which often includes definitions and contexts in both languages, usually from comparable resources) and the CREATERMinal (which includes parallel bilingual contexts). As noted by Bowker (2011: 221), in spite of traditional terminology guidelines, translators increasingly tend to value translated sources (parallel corpora, translation memories) and the rapidity and ease of use these information sources offer. Although the benefits of comparable corpora in terminology work are well established, it seems that the inclusion of complementary translated information can be an asset in the eyes of the trainee translators.

Future work will allow us to investigate the use of these resources in more detail and to better understand to what extent these preliminary guidelines are relevant, and why. It will be essential to gather more data from a wider variety of users in order to identify more generalizable trends in requirements and preferences. A more in-depth study of the use of the resources by participants (e.g. using screen recording and interviews, or—resources permitting—using eye-tracking and keystroke logging tools to monitor users' activity) could allow us to obtain a more accurate and detailed picture of how students use such resources and their contents, and what factors they take into account in evaluations.

By gaining a better understanding of the design, use and usefulness of student-friendly, relation-rich resources, we will be better able not only to produce richer and more useful tools but also to better train students to use and even create them in the workplace.

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