In defense of a pedagogical application of Specialized Lexicography/Terminography with the aid of Corpus Linguistics in ESP professors' training

Em defesa de uma aplicação pedagógica da Lexicografia Especializada e da Terminografia com o auxílio da Linguística de Corpus na formação do professor de ESP

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Abstract: Teachers of ESP (English for Specific Purposes) in graduation/professionalizing technical courses face the challenge of having to work with specialized technical-scientific language in English with students of these areas. These teachers hardly ever receive any training regarding this scenario. This article argues in favor of including pedagogical practices and procedures from Specialized Lexicography and Terminography, under a textual perspective, combined with Corpus Linguistics, so that professors of ESP may rely on these skills to improve their teaching techniques regarding technical-scientific lexis.

Keywords: ESP professors; pedagogical lexicography/terminography; corpus linguistics.

Resumo: Professores de Inglês para fins específicos em cursos profissionalizantes e de graduação encaram o desafio de trabalhar com a linguagem técnico-científica em Inglês com os aprendizes destas áreas. Os mesmos professores raramente recebem algum treinamento com relação a esse cenário. O presente artigo defende a inclusão de práticas e procedimentos pedagógicos da Lexicografia Especializada e da Terminografia, sob uma perspectiva textual, em conjunto com a Linguística de Corpus. Desta forma, os professores de ESP terão um aparato de habilidades que possibilitarão um bom trabalho com a linguagem técnico-científica de uma dada área.

Palavras-chave: professores de ESP; lexicografia/terminografia pedagógica; linguística de corpus.

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Introduction

The current educational context in Brazil, especially regarding professional training and university, has been making efforts towards the improvement of the knowledge of a foreign language, mostly English, through programs such as English without Borders (Finardi, 2016), among others. Being able to, at least, read, and ultimately, write and communicate in English is a necessity that has been connected not only at post-grad level, but targeted at graduation and professional training of technical and scientific areas. Several public and private universities have inserted technical/scientific subjects in their curriculum which are either taught in English, through EMI - English as a Medium of Instruction (Dearden, 2015) or work more specifically with the lexical constructions involved in this technical/scientific area (Miranda and Stallivieri, 2017).

The teaching of English targeted at reading comprehension/ writing of a given scientific/technical domain stems from the teaching of ESP (English for Specific Purposes), aiming at adjusting the teaching of the language to the necessities of a specific group of students (Hutchinson and Waters, 1987; Orr, 2002). In Brazil, usually, the teacher or the professor is the sole responsible for preparing and developing material to aid students of technical/scientific areas develop the necessary skills needed to better comprehend texts and the lexical apparatus of these areas.

Taking into account that specialists of technical/scientific domains use specialized language and very fixed types of textual construction (Hoffmann, 2015), it is safe to assume that areas of study which are technologically supported such as Specialized Lexicography and Terminography, combined with Corpus Linguistics, may play a very important role regarding the planning and building of material and lessons. Therefore, it seems safe to assume that teachers and professors who work with ESP should receive specific training and preparation that would include minimal notions regarding specialized language and the procedures and concepts advocated by areas such as Specialized Lexicography, Terminography, and Corpus Linguistics. Unfortunately, that does not happen as a rule. Work developed under this premise is mostly carried out through the effort of teachers, professors and researchers who try to familiarize themselves with these areas of study, and then apply their knowledge to the building of techniques, tools, material or lessons targeted at the necessities of their students. There are, however, few attempts at turning Lexicographical and Terminographical procedures aided by Corpus Linguistics into strategies for the training and preparation of professors who will have to work with ESP inside classrooms of technical and scientific teaching in Brazil, either on graduation level or even high school technical training.

Considering all of this, the main objective of this article is to discuss how Specialized Lexicography and Terminography, aided by Corpus Linguistics and considered under a pedagogical point of view, may be beneficial for the training of future teachers and professors of ESP. The article will present some definitions in order to guide the reader, and then argue in favor of a pedagogical perspective of Specialized Lexicography and Terminography.

Some definitions: Terminography, Specialized Lexicography, Corpus Linguistics

Whether there is a difference or not between Terminography and Specialized Lexicography is a question which is largely debated in academic research. Some consider both practices as completely diverse,

especially regarding preferences of linguistic theories and theoretical positioning frontwards methodologies, concepts, etc. (Ciobanu, 2003; Schierholz, 2012); others consider there are points in common between them: Bevilacqua and Finatto (2006) regard Terminography as an application of Terminology theories and Specialized Lexicography as a branch of Lexicography, which in its turn is affiliated to Lexicology theories. Specialized Lexicography and Terminography, according to Marzá (2012) and Bergenholtz and Nielsen (2006), may benefit from each other's exchange of practices and methodologies.

On the other hand, some researchers consider Terminographic and Specialised Lexicographical practices as practically the same. According to Bergenholtz and Tarp (2010) and Bergenholtz and Nielsen (2006), Specialised Lexicography and Terminography are a single field of study with different nomenclature. They argue that both are concerned with real and specific needs of the target audience/reader, resulting on the specialized dictionary. This point of view is also shared by Finatto (2014, p. 248), acknowledging both practices in the Brazilian scenario as likewise, due to their descriptive nature of terms and the purpose of producing quality specialized dictionaries, glossaries, databases, etc.

Both Lexicography and Terminography have their pedagogical counterparts. Welker (2008) and Tarp (2010a; 2011), Pedagogical Lexicography is a process regarding the study and production of dictionaries for learners, with pedagogical goals. These products focus on aiding language learners or learners of a specific area grasp concepts and lexical material under a didactic approach.

Stemming from a Pedagogical Lexicography is a practice named Specialized Pedagogical Lexicography, which functions more or less the same as the previous, however concentrating more on specialized language of specific technical and scientific domains. Its main goal is to facilitate learning for lay or semi-lay users of this technical language (Bocorny *et al.*, 2010). As stated by Marzá (2009), Specialized Pedagogical Lexicography is based on some main points: users and their situations and necessities.

A pedagogical perspective of Terminography is a relatively new point of view, defined by Fadanelli (2017) and Monzón (2017) as a practice in which the terminology of a given specialized domain is dealt with according to the needs of a specific pedagogical context; to be then used to produce tools and teaching material for the same context.

Both Pedagogical Lexicography and Terminography may use Corpus Linguistics in their procedures. Corpus Linguistics makes use of computerized tools to empirically analyze language, giving it quantitative and qualitative focus (Biber, 1988; Berber-Sardinha, 2004). Corpus Linguistics first observes patterns and behavior of language in its natural habitat, and then formulates theories and assumptions about it. Corpus Linguistics shows that language is used in patterns, with correlations among uses and contexts (Berber-Sardinha, 2010). Corpus Linguistics may be added to the practices of both Lexicography and Terminography because it offers the opportunity for the researcher, and therefore the ESP teacher, to analyze and study the language present in texts where natural language occurs.

Specialized Lexicography/ Terminography + Corpus Linguistics: beneficial for the training of future teachers of ESP

Celani (2016, p. 551) questions how we can tackle the ever seeming disconnection between the knowledge generated by globalization and the globalization of knowledge. In the particular scenario

of training students for technical-scientific areas in Brazil, this disconnection is very apparent. While students are learning about a specific technical domain, in the globalized world of nowadays it is unlikely that these students will not face the necessity of dealing with textual genres written in a foreign language. These genres may be valuable tools to provide students with the knowledge they need in order to act as capable professionals. Therefore, the better one's skill in reading and interpreting technical-scientific documents in a foreign language, the more chance one will have of being successful, demonstrating how globalization could generate knowledge.

The textual genre, then, is established by Bazerman (2009) as a social agent that has the power to include the user of this genre inside a specific community. Therefore, the ESP teacher must take a stand to include and empower the students (Leffa, 2006) within that specific technical-scientific community, so that these same students may share the knowledge they produce on their own, thus globalizing it.

However, the teaching of English regarding reading documents of technical-scientific domains still needs to improve in Brazil, especially in the academic environment. According to Gimenez and Passoni (2016), 62% of college students participating on the Language Without Borders program would not achieve A2[2] level in the TOEFL ITP test. In February 2016, only 30% of the academic population would achieve a B1[1] level (Sarmento e*t al.*, 2016).

The improvement that is so necessary in the academic scenario regarding reading and interpreting technical-scientific texts in English may be better achieved through the implementation of Lexicographic/Terminographic procedures, aided by Corpus Linguistics, to the training of ESP teachers and inside the educational context as well.

Specialised Lexicography and Terminography are often viewed as a practice of producing dictionaries, glossaries, databases, etc. Nevertheless, the procedures applied for the production of dictionaries are not very different from preparing material or lessons for ESP teaching contexts that work with specialized language: it is common practice to investigate the lexical characteristics of that technical-scientific domain and then use this information to work with meanings (Orr, 2002). According to Finatto (2014, p. 249) the Brazilian context eagers for more than just a terminological printed dictionary: it wishes for information that is "connected to a certain concept lexically expressed in texts from a given domain, that is terms, designations, and expressions that are similar to terms, definitions, phraseology, frequency of use, designative variability, recurrent lexical clusters, etc."

Likewise, ESP lessons which work with technical-scientific language must include information that is highly relevant to the formation of learners who have two tasks ahead of them: learning the concepts of the technical domain and learning how these concepts are expressed in a foreign language. On the Lexicography field, the Function Theory (Tarp, 2010b; Bergenholtz and Tarp, 2010) works closely with the design of tools and dictionaries that meet specific needs of genuine users. The learners of specialized areas will deal with a considerable amount of language found in texts from the technical-scientific domain.

Hence, it is important to think of an approach that relies heavily on text genres which are used by professionals of the desired technical domains. The Terminological Textual approach (Ciaspucio,

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[2] According to the Common European Framework of Reference for Languages (CEFR). (COE, 2019)

1998; 2003; Krieger, 2004; Bourigault and Slodzian, 2004; Hoffmann, 1998; 2004) seems to be the most suitable here; if the objective of ESP classes in technical-scientific training is to prepare students for the reading and the writing of texts, it seems very appropriate to use the texts of these domains as a starting point.

The Textual perspective states that it is the text that attributes the value of specialized language to the lexical constructions (Monzón and Fadanelli, 2016), while allowing for an observation of the macro and microstructures of the textual genre. According to Biber (2010, p. 241):

> In the genre perspective, the focus is on the linguistic characteristics that are used to structure complete texts. These are conventional linguistic characteristics that usually occur only once in a text. For this reason, genre studies must be based on analysis of complete texts from the variety. These language features are conventionally associated with the genre: they conform to the culturally expected way of constructing texts belonging to the variety.

The ESP professional may take advantage of the Textual perspective because by examining the textual characteristics of a given technical-scientific genre, either to prepare the lesson or within the lesson with the learners, the teacher will be able to help students develop reading techniques to better interpret these texts. The teacher may help learners connect vocabulary to the context; for example, Fadanelli (2017) found out in data collection procedures that a considerable amount of learners were unable to connect the meaning of lexical items or bundles to information presented in the surrounding of the text, which would definitely help them understand the meaning of the expression very easily.

The practice of building dictionaries can become very productive when developed inside the classroom context. The work of Cubillo (2002) is a good example: the researcher developed an activity in which her students had to gather and organize information to include on their own Chemistry dictionary. This allowed for an insight into the difficulties expressed by the students, generating valuable information that could be used to tackle their needs.

Both Lexicography and Terminography are largely developed through the aid of Corpus Linguistics methodologies. Rajagopalan (2006) states that Corpus Linguistics' pairings with Lexicography has been very successful in establishing real practical applications to Applied Linguistics by registering the multiple uses of language in their constant evolution, resulting in pure empirical investigation.

Finatto *et al*. (2010, p. 231) argue that Corpus Linguistics enables a new dimension for the teacher-student's relationship, allowing both to become potential researchers.

Carmen Dayrell's (2010) research shows that the comparison between learner's corpora and native speakers' corpora of written texts offers important contributions for the compilation of teaching material and the composition of course content. She identifies important differences in the use of the lexical occurrences of some language patterns in abstracts written by learners and by native speakers of English. Moreover, considering that learners should be made aware of these differences, it seems clear that gathering practices of CL with Lexicographic/Terminographic procedures represents a valuable step on improving the methodology for the teaching of ESP.

Corpus Linguistics can provide professors and teachers who work with ESP with numerous invaluable data, for example: a) data regarding frequency of usage of words and combinations of words; b) data which shows the most important morphosyntactic features of texts; c) information on the behavior of collocations and colligations present on the genres an ESP teacher may need to use;

Research carried out by Fadanelli (2017) proposed the construction of a pedagogical glossary for learners of Electrical Engineering technical terms in English. One of the main text genres used by electrical engineers, the datasheet, was analyzed through the use of Corpus Linguistics tools which determined the most frequent terms and combinations present in these texts as well as their most frequent morphosyntactic categories. This data helped the researcher to establish some criteria for the selection of lexis to be included in the glossary; furthermore, it aided Fadanelli in the production of pedagogical activities that could tackle the learners' main difficulties with technical terms from the area of Electrical Engineering.

Another interesting example is the work by Monzón (2017), who verifies the terminological relevance and pedagogical potential of the occurrences and collocations in a corpus of Computer Science articles; and later proposes terminological-pedagogical aid for English research article reading, through the basic design of an educational app that meets the needs of students inserted in the courses involving computer programming.

Fadanelli and Monzón (2017) gather part of their research to provide insight into how the application of Corpus Linguistics and Natural Language Processing (NLP) tools can help the professor to determine which collocations and which morphosyntactic combinations are more relevant in the context of teaching ESP for learners of Computer Science and Electrical Engineering. They make use of tools such as the free software AntConc[3] and the online tool TermoStat[4], which allow for research of collocation and the morphosyntactic composition of texts, respectively.

Final remarks

The present article aimed at presenting some arguments in favor of the usage of Specialized Lexicography and Terminography together with Corpus Linguistics technological tools to facilitate the work of ESP teachers who need to work with technical terms and lexis from technical-scientific areas in English. The need to include a textual perspective on the pedagogical application of Specialized Lexicography and Terminography and some studies taking advantage of Corpus Linguistics' tools and procedures were elicited.

Taking into consideration all the arguments and studies here presented, it is of paramount importance that procedures involving Specialized Lexicography and Terminography aided by Corpus Linguistics gain a wider space inside the university curriculum for future ESP teachers; otherwise the work of these professionals might become too reliant on existing material or on the teacher's intuition, instead of solidly be based on data provided by the text genres learners of this technical lexis need to read and/or write.

[3] Laurence Anthony's Website (2019).
[4] TermoStat Web 3.0 (2019).

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