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## TEACHING AND LEARNING TERMINOLOGY IN SECONDARY EDUCATION THROUGH LANGUAGE

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**Abstract:** This article analysis the implementation of a five-phase learning strategy for students with no prior experience in terminology extraction and management, and a tool suitable both for autonomous and in-class work. As it will be shown, the tool provides relevant results even with a relatively small amount of data, thus allowing a fast learning curve. Teaching a second language involves the elicitation and acquisition of the general expressions that may be useful for students in everyday situations in which the target language is spoken. However, in the present context of strong scientific development, many learners are also faced with the need to become acquainted with terminology representing complex and abstract concepts. This holds especially true for immersion programmes, in which students must gain an understanding of curricular subjects such as mathematics or history entirely in a second language. A methodology is proposed in this paper for retrieving domain lexicons from texts, which can contribute to the acquisition of specialized knowledge at later stages of pre-tertiary education.

**Keywords:** Foreign Language Teaching, Terminology, Computer-mediated teaching, Secondary school education, Immersion programmes.

### Introduction

Technology and science development have significantly affected the way contemporary society perceives the world. From a linguistic point of view, however, the steady growth of scientific research has resulted in a continuous need for the non-expert community to understand the academic discourse — predominantly in English, which pervades the media and the Internet. Students who are close to entering university as well as vocational schools constitute a group that is particularly exposed to the wealth of technical vocabulary, since they are required to manage a great part of it proficiently within a relatively short time. Unfortunately, while general-vocabulary teaching has been a main topic of research across all levels of education, terminology instruction has traditionally focused on undergraduate and postgraduate courses, with relatively scarce attention to secondary education.

The importance of this lack should not be overlooked, especially in the light of recent research, which has argued that technical vocabulary in a second language is one major factor challenging students' achievement

during the first years at university. In many European countries, for example, immersion programmes have helped alleviate the problem by improving students' lexical coverage of specialized domains prior to higher education, mainly based on the repeated exposure to academic texts and speech. However, the approach to language in these programmes is mostly implicit so that terms are learned incidentally as they appear in the syllabus. In addition, there is not sufficient connection between immersion and the principles of terminological analysis, which, in fact, is the discipline that studies specialized terms and concepts from technical areas of knowledge such as computer science, biochemistry or economics.

### Methodology approaches of terminology instruction

The question arises as to how terminological practice must be implemented in the foreign-language teaching and/or content classroom. This section answers this question by providing a didactic framework, which puts students at the center of the terminology-construction process. Essentially, the goal is that they learn to collect

a set of scientific texts from selected sources and then extract specialized vocabulary from them automatically using dedicated software online. A five-phase methodology is proposed. In phase 1, the teacher introduces academic language and technical vocabulary, focusing on its main features, such as abstractness, specificity and completeness. In this phase, he/she also presents the notions of “terminological unit” and “corpus”, which the students will need for the subsequent activities. By way of example, the teacher may show the lexicographic definition of several well-known terms, or, alternatively, let the class elicit some spontaneously. The importance of this initial step lies in that the students become aware of the differences between common and scientific discourse. For that purpose, the teacher must emphasize the importance of terminology regardless of the differences in the students’ backgrounds and goals. In phase 2 the students choose a topic of analysis taking the core subjects in the curriculum as the starting point. The aim is that they identify with the teacher’s support areas that can be interesting from a terminological point of view and then refine them by means of keywords. Crucially, the teacher must build on the student’s knowledge to identify topics of common interest among groups in the classroom and motivate greater engagement. He/she must also provide the students with online sources of scientific articles, which will form the basis for the exploratory activity later on. Two valuable resources for this purpose are the “New scientist” and “Frontier of young minds” websites, which offer informative readings suitable for a majority of young learners<sup>1</sup>. A Web Quest activity may be additionally suggested so that the students can conduct self-driven searches on academic catalogues and thematically related websites.

### **Teaching terminology**

In order to implement the methodology outlined above, this section discusses that teaching students to extract terminology from texts can provide them with valuable insights into the nature of technical vocabulary while

increasing their scientific knowledge. Terminology extraction is defined as the process of automatically retrieving single and multi-word units representing specialized concepts. Examples of such units are “antigen”, “cytochrome” or “b-cell” in the field of medicine, and “algorithm”, “assembler” or “debug” in computer science. Retrieving terminology commonly requires the use of ad hoc computational tools called “extractors”, which are designed to gather terms from corpora. What is of interest to this paper is that term extraction poses an opportunity both for the teacher to update his/her didactic approach to the curriculum instructed in an L2 and for the learner to gain disciplinary knowledge by exploring new contents.

Pedagogically, the tool has three main advantages. Firstly, it is multilingual; thus, the teaching model proposed here can be applied to any content and/or foreign-language class regardless of the subject areas. It should be noted at this point, however, that during the data processing, the tool relies on language-specific filters to improve the relevance of the results; although these can be conveniently adapted for different languages. Secondly, candidate terms can be studied in context, since the tool allows the users to check the co-text of the elements retrieved so that their meaning can be easily identifiable. Moreover, to make the checking process quicker, the extractor enables the removal of functional and common words, since both are terminologically irrelevant, as well as non-lexical items such as numbers or symbols.

### **Integrating terminology in the classroom**

This section elaborates on phase 5 presented in Section 3 by proposing a poster activity to be carried out in the newly created terminology classroom. Word lists consist of an enumeration of decontextualized linguistic expressions, and, as a result, their usefulness might be questioned, especially when compared to input-based models. This section argues, however, that word lists do not necessarily entail traditional presentation-practice-production approaches to language teaching; rather, they

can be included as an integral part of task-oriented and role-play activities. Discussion of vocabulary lists immediately triggers negative ideas of the deliberate rote learning of words out of context. The integration of terminology subjects in secondary school curricula as proposed by this paper is intended to spark in-depth discussion about the implications of teaching terminology in the broader context of CLIL and bilingual education. In this regard, the terminology extraction methodology suggested by this study not only aims to help students widen their technical vocabulary, but also to crucially assist them in acquiring the knowledge of content subjects in CLIL contexts. This is done by combining computer-assisted and data-driven techniques with more traditional pedagogical strategies to L2 learning, such as reading, writing and the use of a foreign language as *lingua franca*.

## Conclusion

The main contribution of this paper has been to argue for the integration of elementary terminological practice into the secondary education classroom. Terminology instruction has been traditionally aimed at university, vocational and professional contexts, with less attention to initial and intermediate education levels. As discussed, however, early exposure to terminology instruction may benefit students' academic progress, especially in immersion programmes, where a second language is used as a baseline for content subjects. The underlying assumption is that young students have the cognitive skills necessary for understanding complex concepts. Working with terminology, therefore, can help bridge the gap between the general education curriculum, on the one hand, and university and/or professional schools, on the other, so that the transition between both can be achieved gradually, particularly in terms of scientific-discourse comprehension.

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