

DO ONLINE GLOSSARIES SERVE THE NEEDS OF ESP VOCABULARY LEARNING?

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1. INTRODUCTION

Learners of English for Specific Purposes (ESP) programs should have access to the more recent terms of their professional fields. Teaching technical vocabulary at universities is an important challenge for teachers so that students can know the more recent concepts emerging in their field (Meristo & Arias, 2021; Tluková, 2019). It is frequent that language instructors plan their ESP courses while in conversation with professors of such domain (Engineering, Social work, Law, Economics, Sciences...).

Nowadays, glossaries can be presented as useful tools to soften this challenge in higher education. They are designed in online, ubiquitous, Computer Assisted Language Learning (CALL) environments for higher education students to build definitions and structures that can be shared cooperatively (García-Sánchez & Luján-García, 2020; Singh & Thurman, 2019). This means that students can explain what the concept is and create examples in context for everyone in their course to understand.

The main purpose of the ESP online glossary is, therefore, to build a space with new terms that students could activate and use in their professions. This would imply that the definition of the concept is clear for others who do not know what it means. Such a concept should sound alright, or it should be well-combined in a sentence when an example in context is offered. Mastering technical vocabulary would allow learners

to be accurate when writing academic assignments, communicating projects and participating in professionally oriented seminars, to name a few.

This qualitative study deals with useful strategies to learn ESP vocabulary in higher education programs. This research aimed at 1) comparing the online glossaries created by the ESP participants of two different degrees: Industrial Design and Product Development and Telecommunications and Electronic Engineering; 2) identifying the most common learning strategies other than the glossaries used by learners; and 3) analyzing the most common definition structures used by tertiary education students. The instruments used in this study were the two online glossaries created by the students and an anonymous survey administered to all participants. Findings revealed that the online glossary is a ubiquitous, constructive and CALL task that help learners enhance the most current technical expressions they face with accurate definitions, correct pronunciation, and examples in context.

1.1. THE ONLINE GLOSSARY: WHAT AND WHY?

The online glossary is a ubiquitous Computer Assisted Language Learning (CALL) task that enables students to build their vocabulary skills in a co-constructive digital environment. The design of online glossaries, supported by platforms such as Moodle, allows participants to access the virtual space anywhere and at any time, and to check the expressions and examples in context other peers have posted on the cooperative glossary. Learners do not require extensive ICT skills to take active part in an online glossary designed in Moodle and they are often satisfied with this task (Breeze, 2013; Carranza Alcántar, Gómez & Islas Torres, 2018).

As a potentially valuable tool in ESP language learning, online glossaries are modeled and explained by teachers to engage students on how to build the monolingual wordlist with new terms of their professional field they might identify while studying their ESP course (Luján-García & García-Sánchez, 2014). Together with the new concepts or acronyms, learners should add the correct pronunciation, which is encouraged to be copied and pasted from a monolingual online dictionary (e.g., *Cambridge Online Dictionary*, *Macmillan*, *Oxford*). The productive function of putting the new term successfully in context, either in written or in spoken

forms, should be clearly established. Likewise, it must be acknowledged that the preferred level for ESP courses should be B2, according to the descriptors approved in the *Common European Framework of Reference for Languages, Companion Volume* (CEFR, CV 2020).

Once the term and the pronunciation are identified, the accurate definitions of the ESP concept must be elaborated, and examples of the term in real context should be added. Writing definitions provides learners with written and lexical strategies they may have or develop while exchanging new emerging concepts. When the online glossary is set in an ESP course program, learners are encouraged to acquire and help others visualize the specific vocabulary they might encounter from an individual and a cooperative perspective. Consequently, it is also significant to address that the online glossary is not a dictionary. On the contrary, it is a context-specific task produced in a particular time by students who are actively involved in the process. As stated by Fuertes-Olivera's study (2018), some previous knowledge on the characteristics that describe a dictionary should be mastered by ESP learners before they actively embark on the creation of specialized glossaries of their professional domain.

1.2. ENGLISH FOR SPECIFIC PURPOSES (ESP) AND THE GLOSSARY

English for Specific Purposes (ESP) differs from General English or English as a Foreign Language (EFL). In both cases, learning words are necessary either for a real-life general context or for a professional one (Agustín Llach, 2017). EFL focuses on the real English that takes place in English speaking countries, so it helps the learners be immersed and adapt to daily life situations. Its curriculum has a general aim so that learners perform different roles according to different topics (travelling, at the coffee shop, writing a complaint letter...), usually contextualized in English speaking countries, where English is the first language (L1). On the contrary, ESP refers to the English language used for Academic and Professional Purposes for non-native speakers of English. It responds to language learning needs so that L2 students are equipped with professional communicative skills to perform a professional task or job (Basturkmen, 2021; Brooks, 2018; Lesiak-Bielawska, 2015). It varies according to the knowledge domain such as history, law, social work or

telecommunications engineering, to name a few (Tudor, 1991, p. 91). As stated by Basturkmen (2015), the ESP teacher must design courses that require mastering the concepts so that specific field texts are described and analyzed. This implies responding to the most current professions so that it must be up-to-date and field oriented to the different expert subjects and the academia.

2. OBJECTIVES

- This research was conducted in the areas of engineering, and more specifically in the compulsory ESP courses of English Applied to Industrial Design and Product Development (EIDPD) in the Bachelor's Degree in Industrial Design and Product Development Engineering, and English for Telecommunications Engineering (ETE) in the Master's Degree in Telecommunications Engineering. The study was designed to address to the following objectives:
- To compare and analyze the format of online glossaries.
- To identify the most common definition structures used by learners.
- To identify the most frequent mistakes students made when elaborating definitions.
- To register whether these ESP students share recurrent terms, expressions or acronyms.

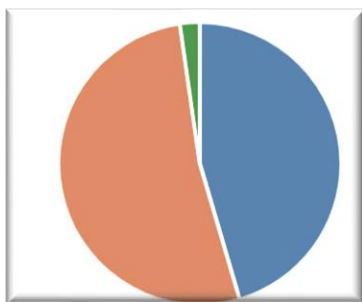
3. METHODOLOGY

3.1. CONTEXT

This qualitative research aimed at identifying the most useful learning strategies students used to learn new ESP vocabulary. It was conducted in a period of 10-12 weeks with the two ESP compulsory subjects, EAIDPD and ETE at the Universidad de Las Palmas de Gran Canaria in Spain. The participants were 33 students in the degree in Engineering in

Industrial Design and 11 students in the master's degree in Telecommunications' Engineering. From the 44 contributors, 23 were women, represented in light grey color in Figure 1, 20 men and 1 other as seen below.

FIGURE 1. Demographic data with over 52% of women's participation (orange) over men in the field of engineering.



Source: The authors

3.2. INSTRUMENTS: THE ONLINE SURVEY AND THE GLOSSARIES

The instruments used for this comparative study were the anonymous survey and the two online glossaries of both mandatory ESP subjects.

The online survey comprised 4 questions to address demographic data regarding students' profile (whether they belonged to the bachelor's or master's degree) and gender in the case of questions 1 and 2. Question 3 enquired about the strategies students found useful when learning vocabulary and question 4 examined whether learners' perceptions regarding their improvement in ESP vocabulary after having taken these two ESP courses.

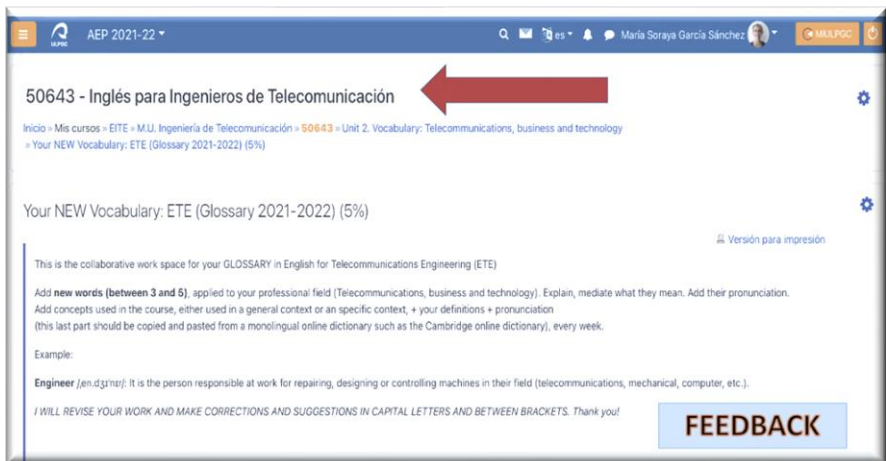
Both glossaries shared similar instructions regarding their format as shown in Figure 2. Students were asked to add new concepts + category + pronunciation + the definition + the example in context. Learners were encouraged to add new expressions they may have encountered not only in class but while doing further tasks or assignments for their degree (reading academic papers, listening to a podcast, watching a video based

on their professional field). Once the new concept was identified, students had to classify as nouns, verbs, adjectives, idioms, etc., and were advised to copy and paste just the pronunciation transcription from a monolingual online dictionary (e.g., Cambridge online dictionary) so that they could finish the activity practicing definition and sentence structures while defining and contextualizing the new concepts or expressions to their personal and/or professional fields.

The terms were automatically structured in alphabetical order, and instructors could also filter the organization of the glossary according to each student' contributions and according to date of publication, that is from the more recent to the oldest term posted on the platform.

FIGURE 2. Online glossary formats of the subjects "Inglés técnico para EIDIP and ETE





Source: The authors

The online glossary for the EIDIP course was offered in a more generic approach with the heading “CLASS ONLINE GLOSSARY” while the ETE course suggested a more personal approach with the use of “Your” glossary and a more detailed the title, specifying the acquisition of “new” concepts, and the percentage of learners’ contribution in their continuous assessment “Your NEW Vocabulary: ETE (Glossary 2021-2022) (5%)” In both cases, learners were given a percentage in their assessment final by adding a minimum of terms in the online glossary (Figure 2). In both cases, learners were encouraged to add 5 new concepts. Finally, students were informed on the importance of avoiding plagiarism and on corrections and feedback. The latter was provided by the teachers on the glossary for all the group members to see and share.

4. RESULTS

4.1. STUDENTS’ PERCEPTIONS

According to the data collected from the online anonymous survey, the strategies that students found more useful to learn vocabulary were the glossaries or list of words in the first place, followed by flashcards, or visual materials in the second place (Figure 3). The other activities students added in the survey (open question) to expand their vocabulary skills were:

- Listening + Speaking activities
- Underlining/highlighting key words of academic/scientific articles
- Building sentences with the new words or examples in context
- Reading technical texts + scientific papers
- Specific dictionaries + glossaries
- Games + competitions
- YouTube videos + tutorials/documentaries + professionally-oriented reports + movies

FIGURE 3. Wordmap: Most common strategies to learn ESP vocabulary



Source: The authors

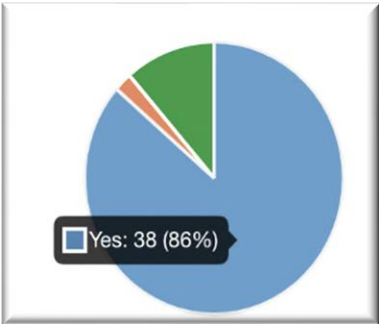
There is tendency to use monolingual glossaries with definitions and examples in context together with monolingual and bilingual lists of words as the most frequent strategies used by most participants. Considering bilingual list of words was especially predominant in women over men. Some contestants' comments regarding this question are shown below:

TABLE 1. Students' comments on their more useful strategies for vocabulary acquisition

Men	<ul style="list-style-type: none"> - Glossaries, flashcards or visual materials like movies or videos - I usually use the translator and glossaries to understand some words. In addition, I normally read texts related to the topic. - Maybe watching documentaries or small reports in English related with engineering. For example, there is one called "How it's made" ("Como se hace"), which has too many chapters in YouTube. It's a show which explains industrial processes of products in a very simple way. - Usually, I listen to a lot of conferences about topics of my field I'm interested in and don't know much about. These topics range from economics to psychology, so they always provide a plethora of new words to my catalog of words. Apart from that, movies, music and books are another great source for new words. - Scientific papers from official journals like IEEE, Researchgate, among others. - A good idea to learn more words faster is to put them in context: instead of writing lists of random words, try putting them into sentences.
Women	<ul style="list-style-type: none"> - I just do bilingual lists of words where I write words that I don't know the meaning of in Spanish. - I find useful learning by glossaries, bilingual lists, key words, videos, listening exercises and also doing speaking practice. - I create glossaries with lists of words, synonymous, visual materials, etc. - Bilingual lists of words, that's the way I learnt in my school and found it really useful because it's easier to memorize. - Visual materials, underlined in a text and bilingual lists of words. - I find useful to learn with visual material like English videos or bilingual list of words, as well as listening to train that field.
Other	I personally really like flashcards and glossaries with examples in context.

The last question in the survey addressed learners' perspectives on their ESP progress. Around 86% of the respondents positively considered a successful progress in their learning as indicated in Figure 4 (marked in blue I the pie chart).

FIGURE 4. Students' perspectives on their progress.



4.1. DEFINITION STRUCTURES AND ESP LANGUAGE USE

Taking into consideration the analysis of the data extracted from the two online ESP glossaries, the most common definition structures students used were sorted in 5 categories:

- Definition St. 1: A/an + concept + (is) + definition
- Definition St. 2A: It is + (adjectives) + concept + relative clause (that)
- Definition St. 2B: It is + (adjectives) + concept + relative clause (who/which) (less frequent)
- Definition St. 3: A synonym + explanation
- Definition St. 4: Use of the defined term + explanation
- Definition St. 5: Others

Figure 5 shows examples of the two most common definitions structures 1 and 2A. The definition structure mostly used by learners began with the indefinite article (*A/An*), followed by the category (*N*), the pronunciation (*/ˈæɪ.l.gə.ri.ðəm/*), the concept (*Algorithm*), the verb to be in present (*is/are*) and the features that define the concept or expression (*the list of instructions and rules a computer needs to do to complete a task*). The second most common definition formats were determined by the use of the relative clause, especially with the relative pronoun “that”, which was preferred over just a few definitions employing the relative pronoun “who” or “which” instead. Some examples of structures 2A and 2B are:

- Structure 2A. **Beam** */bi:m/ NOUN (COUNTABLE)*: It is a long, stiff and strong piece of material that is used to withstand weight in a building or construction.
- Structure 2B. **Branch** (N) */bra:ntʃ/*: It is a parallel version of a repository, which allows the programmer to keep developing and adding new features to the code without affecting the main part of the project.

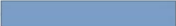
FIGURE 5. Students' contributions in both glossaries.

Most common definition structure 1: Example



ALUMINIUM

Aluminium/ə'lʊ:mɪnɪəm/NOUN (UNCOUNTABLE): An aluminum is a metal that can be used in the construction of different elements.

"I want to design a platform made exclusively with aluminum." 

Most common definition structure 2: Example



Toll-free (N)



It is a type of call that is free for the person who is calling. The cost of the call is paid by the company you are calling.

Definition structure 3 implemented the use of synonyms as another strategy students found convenient to develop the explanations of new concepts as it can be observed in the example of the term “Building” extracted from the EIDIP glossary:

Building /'bɪldɪŋ/ NOUN (COUNTABLE): construction made with resistant materials and is made for the development of human activities, like living or working.

The definition form used for term “DevOps” by ETE students is an example to illustrate the most common definition structure number 4. In this case, learners opted for including the term defined in the definition itself. So, the concept “DevOps”, for instance, was used as part of the proper definition as it can be seen in the example. This format was usually more extensive so that students tended to add two or three more sentences to clarify the meaning of the concept with a more thorough explanation and additional expressions such such “It refers / It describes, ...:

DevOps (N) /dev'ɒps/: The term **DevOps** is a combination of the terms development (/di'vel'əp'mənt/) and operations (/ɒp'ər'eɪ'ʃən/). It refers to the combination of people, processes and technology to deliver value to customers continuously, as well as enabling previously separate roles to coordinate and collaborate to produce better and more reliable products.

This example corresponds with definition structure 5, which was often built with a variety of expressions that would introduce the concept as in “It means that / It refers to / A phenomenon where / A concept that / A method employed in...” Again, definition format 5 often required at least two sentences to define the concept. The difference between structures 4 and 5 is that the format included the concept defined in its own definitions while the latter did not. Two examples of definition structure 5 are provided below:

Bespoke (A) /brɪˈspəʊk/ **It means that** something is done exclusively. In the technological context it is used to indicate custom software developed only for a user or a purpose.

Crosstalk (N) /krɒs.tɔ:k/: **A phenomenon where** a signal transmitted on one circuit of a communications system is detectable or creates an undesirable effect in another circuit or channel.

Another finding of this study is the use of acronyms and abbreviations, frequently integrated in ESP programs as technical vocabulary learners use in the professional field of engineering. It was a satisfactory remark to highlight that students demonstrated having understood the differences between both groups and as such well-developed definitions were offered, clearly stating whether it was an abbreviation or an acronym. This was revealed not only in the definitions when learners identified the expressions as acronyms or abbreviations, but also in the pronunciation transcriptions. As it can be shown below, the acronym is pronounced as a word (CAD /kæd/), and the abbreviation is pronounced by its initials (LED /el.i:ˈdi:/). This particular result was evidenced by learners of the ETE glossary. Due to the highly command of specific expressions of their field, students in the postgraduate course had to make use of a wide range of abbreviations for their master’s thesis. These two examples of acronyms and abbreviations, extracted from the ETE glossary, are shown below:

CAD (N) /kæd/: It is an acronym that stands for Computer Aid Design. A software whose purpose is to help the user to create objects modeled in 3D or maps in 2D.

LED (N) /el.i:ˈdi:/: Abbreviation for light-emitting diode. A semiconductor device used as source of light based on the current that flows through it. The product lifetime of a LED is generally longer than

an incandescent light bulb and it consumes much less energy. This features make the LEDs an improvement for daily life and sustainability.

Also, inferred from the analysis of these two online glossaries, common mistakes were acknowledged and classified. This was important since students had their definitions and examples in context revised by the instructors. So, whenever necessary, corrections were made and suggestions to improve the structure of definitions or sentences in context were provided to each learner. The most common mistakes students performed were categorized in six sections: *Use of English*, *Vocabulary*, *Punctuation*, *Sentence Structure*, *Wrong Word* and *Spelling*. Figure 6 shows two examples of both glossaries. The term “Radio”, extracted from the online glossary of the EIDIP course, marked with a lighter grey color the mistakes students had, while the online glossary of the ETE course also added a comment or suggestion to improve the identified mistakes (See “Fetch” with mistakes marked in a lighter grey color and the comment provided by the instructor in Figure 6).

FIGURE 6. Classification of most common mistakes and examples of corrections and feedback

• Use of English
• Vocabulary
• Punctuation
• Sentence structure
• Wrong Word
• Spelling

Radio /'reɪ-di-əʊ/ (N): Its an device which can be portable for which you can listen notice about nowadays.

Fetch /fetʃ/ (V): It is refers to the latest changes in a repository that have not been merged into the main repository.

While reading your definition, it seems that you are defining a noun, and it is a verb. Maybe you could say: "It is the action of providing/making the latest changes that have not been merged into the main repository."
(COMMENT BY TEACHER)

Aligning with Breeze’s (2013) and Tluková’s (2019) studies, the findings of this research contribute to the field of ESP in higher education with the implementation of the online glossary to improve students’ retention of the technical concepts they may have read or listened to in their professional context. The online glossary is reported to be useful and accurate while defining ESP concepts, acknowledging the importance of a correct pronunciation, elaborating examples in contexts, developing written and lexical learning strategies, sharing terms among

the ESP learning community and picturing (and, also, helping others visualize) new emerging terms of their professional fields. It is not only important to learn the concept with the right spelling and pronunciation but to be able to explain it with your own words and to use it properly, that is, to understand its position in a sentence and its possible combination with other words or collocations.

Furthermore, learning technical expressions through the online glossary responds to current students' needs. New concepts, acronyms and abbreviations appear every year with the advances of technology, communications, and research in any field. This is important since specific lexical needs are covered to respond to the particular group of students, their professional environment and all set in a particular academic year. Moreover, as some researchers have reported, ubiquitous CALL approaches have rocketed ESP learners' access to explicit knowledge/terminology they must understand in real context (García-Sánchez & Luján-García, 2020; Elgort, 2018). These precise concepts are shared by the ESP students on the cooperative online glossary. The online glossary is built so that students are encouraged to activate their vocabulary and put those words into practice through elaborated paragraphs, debates, roleplays, or mini research projects, for instance, that students create as communicative assignments designed for their ESP courses (Tluková, 2019).

In terms of the instruction and learning of specialized technical vocabulary, which differs from general service vocabulary and non-specialized academic vocabulary (Escudero, 2012), these findings stand in line with Chien's research (2020) since it had a positive influence on learners' use of such expressions while elaborating the online dictionary. Using the specific terms is also beneficial and necessary for learners in situations in which they create the communicative tasks designed for the ESP subjects: their written assignments and oral presentations, for example.

In a different vein, it is important to acknowledge that this technical vocabulary posted on the cooperative glossary becomes a key component in students' lifelong learning process and as such it has been promoted in these two ESP courses. This constant and changing

vocabulary is essential during the academic years learners spend in their higher education programs and when they are doing their vocational training and job tasks at work (Coxhead, McLaughlin & Reid, 2019; McLaughlin & Parkinson, 2018). So, implementing a lifelong learning approach in higher education with the use of the online glossary is seen as an advantage for the forthcoming professionals of the future.

5. CONCLUSIONS

This article summarizes some common strategies to learn technical and specific vocabulary in higher education programs with the implementation of the online glossary. This task should be efficiently integrated into ESP language courses to support ubiquitous, constructive and CALL learning, and to enhance students' most current technical expressions from a cooperative learning perspective.

This study also reported on the students' perceptions regarding their vocabulary learning strategies and it identified the 5 most common definition structures used by learners, being the structure starting with the indefinite article (*A*), followed by the concept (*algorithm*) the verb to be (*is*) and the rest of the defining characteristics (*the list of instructions and rules a computer needs to do to complete a task*) the one preferred by most participants. The results also suggest that the online glossary is a unique piece of cooperative learning that is context-specific, and it depends on the ESP words the group of students may select each year. The research also highlights the importance of establishing a positive learning environment with cooperative learning and constructive feedback so that learners can develop successful learning approaches that tackle the importance of adding new up-and-coming vocabulary in their lifelong learning professional career. With the collected data, the researchers would like to expand their investigation to other ESP fields and further explore the use of neologisms and anglicisms ESP tertiary education learners use in their professional fields.

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