English for Specific Purposes: mapping discourse genres in a technical school[1]

Inglês para Fins Específicos: mapeamento de gêneros discursivos em uma instituição profissionalizante

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RESUMO

A expansão da Rede Federal de Educação Profissional e Tecnológica, a qual é formada por vários instituições federais de educação de nível médio e pós-médio no país, impõe um desafio ao professor de língua inglesa que trabalha em tais instituições, já que este profissional terá que trabalhar com uma audiência bastante diversificada. A falta de familiaridade com distintas áreas profissionais é geralmente um obstáculo, que se torna ainda mais desafiador pela ausência de materiais de ensino voltados às diferentes áreas profissionais com as quais precisa atuar. Consequentemente, o professor percebe a necessidade de produzir seu próprio material e a perspectiva do ESP pode contribuir nesta tarefa ao ajudá-lo a investigar as necessidades de letramento de seus estudantes. Deste modo, este estudo relata os resultados de uma análise de necessidades cujo objetivo foi mapear os gêneros discursivos para propósitos acadêmicos e profissionais que podem informar tanto o design de um curso ESP quanto a produção de material pedagógico para quatro cursos técnicos subsequentes ao ensino médio oferecidos por uma escola técnica no Rio Grande do Sul. Os dados foram coletados por meio de entrevistas não estruturadas com estudantes e professores dos cursos investigados e de questionários semiestruturados.

Palavras-Chave: ESP, Gêneros discursivos, Educação profissional

ABSTRACT

The expansion of the Federal Network of Vocational, Scientific, and Technological Education, which comprises many federal institutions aimed at secondary and post-secondary professional education throughout the country, presents a challenge for English language teachers, as they will be required to teach to a wide range of audiences. The lack of familiarity with the different professional areas is often an obstacle, worsened by the lack of teaching materials directed towards the different professional areas. As such, teachers are often faced with the need to produce one's teaching material, and ESP can contribute by helping the language teacher investigate their students' literacy needs. As a result, this study

presents the findings of a student needs analysis whose aim was to map discourse genres for academic and professional purposes, which could aid in developing both an ESP course design and pedagogical material for four post-secondary technical courses offered by a technical school in Rio Grande do Sul. Data collection drew on unstructured interviews with students and their domain specialists and two semi-structured questionnaires.

1. Introduction

In Brazil, since the early 1990s, genre-based studies began to draw the attention of pedagogical material designers and teachers in the context of mother-tongue teaching and learning, which was intensified by the publication of the national education guideline Parâmetros Curriculares Nacionais (BRASIL, 1998) (RAMOS, 2017, p. 788). In the area of additional languages, especially regarding English for Specific Purposes (ESP), international studies on genre-based teaching and language learning have been published since the 1980s (for example, DUDLEY-EVANS, 1987; SWALES, 1990). However, in Brazil, studies on ESP genre-based teaching and learning are currently carried out within diverse contexts and require further investigation (CRISTÓVÃO; BEATO-CANATO, 2016, p. 56; RAMOS, 2017, p. 788).

In the late 2000s, Brazil experienced the expansion of the Federal Network of Vocational, Scientific and Technological Education, also known as EPT network (Professional and Technological Education) (BRASIL, 2008), and several federal institutions aimed at secondary and post-secondary professional education were implemented throughout the country. As a result, numerous technical courses were created, emphasizing the need to produce more knowledge on ESP and a genre-based approach aimed at professional education (LABELLA-SANCHEZ, 2014; CRISTOVÃO; BEATO-CANATO, 2016).

An additional language teacher working at an EPT institution is challenged, from the beginning, by the complex task of teaching to very different and diverse audiences. Students in career and technical education, undergraduate students, adults who have returned to school to pursue a secondary level diploma while concurrently pursuing professional qualifications, and people who are already in the workforce seeking professional certification by completing a post-secondary technical course are all met by this professional. The additional language teacher is also required to work in several different technical courses within the same institution as well as with different audiences and teaching modalities. The lack of familiarity with specific professional areas is often an obstacle, worsened by the lack of teaching materials geared toward specific professional areas.

The consequences of these limitations could be verified at Technical Industrial School of Santa Maria (CTISM) in Rio Grande do Sul, southern Brazil, where our study took place, when the institutional

evaluation[4] of the ESP subject, which takes place at the end of each academic semester, revealed that students wanted to work with texts that were more representative of their professional area.

In this scenario, it is important to recognize that a teacher's position in the classroom entails more than the provision of knowledge. Rather, teachers should be regarded as a driving force for designing and implementing the necessary changes their teaching context requires. According to Richards and Farrell (2005), teachers should carry out classroom research that has the objective to explain and address teaching issues and problems from their context. In this regard, it is paramount that the additional language teachers know the literacy practices for academic and professional purposes in teaching, which may better inform the teacher's pedagogical choices and practices. This premise, by the way, has long been the focus of the ESP tradition in Brazil since its very beginning with the creation of the Brazilian National ESP Project, coordinated by Maria Antonieta Alba Celani in the 1980s, at Pontifícia Universidade Catolica de Sao Paulo (CELANI et al., 1988). This project along with the creation of a resource center – CEPRIL (an acronym in Portuguese for Center for Research and Information on Reading) have paved the way for ESP researchers and practioners in the national context. ESP can help the teacher investigate literacy needs, usually the starting point for designing teaching programs more responsive to students' needs. Thus, this study aims to report a student needs analysis from four post-secondary technical courses offered by CTISM. The needs analysis sought to map the discourse genres relevant for academic and professional purposes, which may inform the ESP syllabus and teaching material production.

In the following sections, a review of the ESP literature is presented, followed by the methodology adopted to conduct the investigation, the results, and the implications of this study for designing ESP teaching materials.

2.   Theoretical perspectives on ESP

ESP refers to English research and teaching where the learner aims to use this language in specific social practices. It began as a branch of English Language Teaching more than 50 years ago now, proposing a "solid basis for pedagogical materials" (HYLAND, 2007, p. 379). It has a long tradition of researching literacy demands in academic and professional environments, shedding light on the many different ways language is used in particular scenarios.

ESP foregrounds this context-oriented principle in language teaching. It highlights at least two critical aspects that meet the current demands in the contexts of technical institutions within the EPT

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[4] By the end of every academic semester, students are required to evaluate their teachers by responding to an anonymous electronic questionnaire survey. Their views on teachers' practice in a given course are used to plan and implement improvements in the teaching process within the institution.

network, the roles of the English teacher and collaborative pedagogies. Usually, working at an EPT institution means teaching students from several different professional areas and teaching modalities. It is not uncommon for the additional language teacher to lack familiarity with those areas. In such cases, teachers rely heavily on existing pedagogical materials in order to partially mitigate the problem. However, the lack of teaching materials for English in specific areas has posed on English teachers the challenge of producing their own pedagogical materials to be used within specific contexts. Thus, teachers face the need to conduct their context-based research and situated practices analyses (HYLAND, 2007).

Since English teachers are usually untrained in expert areas, such as electrical engineering or industrial automation, "collaboration with both students and subject specialists is essential" (HYLAND, 2007, p. 387). A key aspect for English teachers to investigate their context and design teaching materials implies developing strategies to collaborate with both students and specialists. The EPT context may present fertile ground for this collaboration to happen, notably with specialists. It provides numerous opportunities for teachers from several fields in the same institution to gather in meetings and exchange ideas. Unlike most Brazilian universities, EPT institutions are not usually divided into departments and centers. Because of this, specialist professionals may be more open to sharing common spaces and collaborating with English teachers in scenarios such as regular pedagogical meetings promoted by the school or even in (in)formal conversation within their offices. Such occasions may facilitate the exchange of thoughts on students' literacy demands, which may then be further investigated through needs analysis, a helpful approach, and a handy tool.

According to Flowerdew (2013), needs analysis is one of the primary steps towards an ESP course development. It can guide ESP designers towards the "what" and the "how" when planning a course syllabus, followed by "materials selection, methodology, assessment, and evaluation" (FLOWERDEW, 2013, p. 325). Hyland (2006, p. 73) defines needs analysis as an "umbrella term" that encompasses several aspects, such as learners' background, goals and reasons for taking the course, their teaching and learning preferences, and the situations in which they are expected to communicate. Analysis, as stated by Hyland (2007, p. 380), "presupposes an understanding of what must be analyzed and a theoretical framework for describing it." More recently, the focus on genres used by members of a specific discourse community[5] and genre analysis (for example, the works of SWALES, 1990, 2004) have helped analysts develop a better understanding of language use in situated practices. It has helped pinpoint and describe relevant

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[5] Discourse communities are "sociorhetorical networks that form in order to work towards sets of common goals" (SWALES, 1990, p. 24).

texts used by people within that community and therefore required by learners (HYLAND, 2007; PALTRIDGE, 2013).

The concept of genre that underlines this study foregrounds the inextricable relationship between text and context (SWALES, 1990; BAZERMAN, 2005; MOTTA-ROTH, 2008; MOTTA-ROTH; HEBERLE, 2015) and allows one to see genre as "socially situated practices" (PALTRIDGE, 2013, p. 354). Consequently, a genre can be described as "language use constitutive of and constituted by social activities, as a relatively stable communicative occurrence with specific purposes in specific sociocultural contexts" (MOTTA-ROTH; HEBERLE, 2015, p. 2).

Swales' work on genre analysis (1990) has greatly contibuted to the ESP approach, particularly by providing a model for analyzing genres and exposing their rhetorical organization, in which the identification of moves and steps assists analysts in understanding how knowledge is structured and expressed to communicate specific purposes (BAWARSHI; REIFF, 2010; HEMAIS; BIASI-RODRIGUES, 2005). Additionally, with the help of the methodological procedures from the Corpus Linguistics field, one can also investigate the lexicogrammar aspects that are prototypical in a given set of discourse genres.

Such features of the genre make it a privileged research and a pedagogical tool. By mapping the genres that are commonly produced and/or consumed by a student or professional in their regular activities in academic and professional contexts, one can understand a large part of their work (BAZERMAN, 2005), which is fundamental for ESP teachers, especially novice ones. From the ESP perspective, genre analysis can provide the necessary comprehension of how a given genre is structured (its discursive characteristics, rhetorical organization, and prototypical linguistic features) and its relation to its context of use in particular social and cultural practices.

With this in mind, the needs analysis reported in this study sought to identify the most recurrent and therefore relevant genres for students from four post-secondary technical courses at a technical institution in Rio Grande do Sul. In the next section, we explain how the needs analysis was developed and conducted.

3. Methodology

This study was conducted according to ESP principles and is based on both qualitative and basic quantitative methods. Firstly, the contextualization of the study in the institution where it took place is presented. Then, we present the tools and procedures developed and adopted to carry out the needs analysis.

3.1. Institution

CTISM is a career and technical education institution linked to the Federal University of Santa Maria (UFSM). It currently integrates the Federal Network of Vocational, Scientific, and Technological Education (or EPT network), which has experienced a significant expansion since 2006 since its creation in 1902 (BRASIL, 2008).

CTISM was established in 1967, seven years after the foundation of UFSM. Currently, there are approximately 1380 students enrolled in one of the 15 courses offered by the institution. Courses are offered in four different learning modalities or levels: four secondary courses integrated into technical courses, seven post-secondary technical courses, three higher education courses, and one Master's degree program.

3.2 Courses chosen for the study

For this study, we decided to analyze four post-secondary courses[6] in which English for Specific Purposes is part of the curricular program: 1) Electrotechnics, 2) Electromechanics, 3) Industrial Automation, and 4) Electronics. The courses are addressed at both the general public and people in the workforce who seek further qualification in the industrial field. English for Specific Purposes as a curricular subject is offered as a 36-hour course for 100-minute class meetings once a week, either in the first (Electromechanics and Electronics) or in the second semesters (Electrotechnics and Industrial Automation).

3.3. Data Collection and Analysis Procedures

Data collection drew on two semi-structured questionnaires[7] designed in 2018, which were addressed at both groups of participants (students and specialist teachers) to collect data on students' literacy needs. The questionnaire was the chosen instrument because of the large number of students and specialist teachers to be interviewed. The decision to elaborate two different questionnaires was due to the assumption that the level of experience within a given professional community may influence the participant's perceptions of their literacy demands. The survey questionnaires were elaborated using the free online survey tool Google Forms platform for three main reasons: 1) free availability for use, 2) ease of use, and 3) ability to export raw data. The questionnaire link was sent to participants by email in August-

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[6] As suggested by a highly experienced specialist teacher who has been working in the four courses for more than 15 years, the courses overlap in terms of disciplines, concepts and kinds of texts to be read, therefore the planning of the courses syllabus and teaching materials could consider the four courses simultaneously.

[7] This study was approved by the Research Ethics Committee (CEP) of the Federal University of Santa Maria, CAAE number 74839817.1.0000.5346.

October 2018, and remained available for 40 days. To ensure a higher rate of student involvement in the research, the lead author set aside time in the school's computer lab during one of her weekly classes with two of the four groups of students she was teaching in the second semester of 2018 (Electrotechnics and Industrial Automation). Students from the other two groups (Electromechanics and Electronics), who had been her students in the first semester of the same year, just received the email link.

Although both questionnaires were designed slightly differently due to the target respondents, both presented multiple-choice and open-ended questions based on the Pedagogical Project of the four courses and the lead author's teaching practices in those courses.

Two main parts constituted the student questionnaire. The first one was designed to collect data on respondents' profiles (professional course and professional experience in the industrial field, age, English proficiency, opinion on the importance of the English language for their professional field). The second part aimed to gather information on student literacy needs in their academic and professional areas,especially discourse genres and language skills. As for the discourse genres, respondents were invited to select the ones they find most relevant from a list based on the current syllabus as well as add new genres if they wanted to.

Similarly, the specialist teacher questionnaire was also divided into two main parts. The first section consisted of general questions (areas of expertise, professional experience prior to becoming a teacher, the relevance of the English language in those areas, teaching experience in technical courses, language proficiency, and opinion on which communicative skill(s) the ESP subject should focus). The second part was divided into four subsections, each corresponding to one of the four post-secondary courses. The questions in those subsections were not mandatory since teacher respondents could work either in one or more courses simultaneously. In those subsections, respondents were explicitly asked to report the discourse genres and skills they considered more relevant for their students to learn during a specific technical course.

The data collected through the questionnaire surveys were analyzed in three steps. First, all the participants' responses were tabulated and analyzed so that their profile, opinion on the importance of English for academic and professional life, and common genres for the classroom and workplace could be mapped. Then, the tabulated data were compared and contrasted to find similarities and differences in participant responses. Finally, the data were interpreted in the light of the literature on ESP and information retrieved from the Pedagogical Project of each of the four courses (more specifically, the Objectives and the Graduate's Profile sections).

In the next section, we present and discuss the results.

4. Results

4.1. Respondents' profile and language skills demands

Although the survey was made available to all students and specialist teachers from selected courses by email, only 31 out of 117[8] students (26%) and 16 out of 22 specialist teachers (73%) responded to the survey, which remained available online for 40 days. Regarding the students, 100% of the respondents were 28 to 35 years old males, 93% were in the second semester of the course (all of which were requested to answer the survey during an ESP class), 64% of them were from the Electrotechnics course, 22% from Industrial Automation, and 6,5% from either Electromechanics or Electronics, which corresponds to 64%, 53%, 4.2% and 7.6% of the total number of students from each course, respectively.

In terms of professional experience, 32% of the respondents said they were already working in their course area. This information is relevant because it suggests that students may be "competent informants" when planning an ESP program and designing teaching materials (HYLAND, 2007, p. 387).

Students' responses on English language proficiency prior to entering their course ranged from knowing a few words in English (45%) to being able to read some isolated phrases and sentences (54%). These findings indicate that any ESP pedagogical planning in this context must consider students' previous knowledge of the language and should be able to offer enough learning or "scaffolding" strategies for new knowledge to be acquired (VYGOTSKY, 1978, p. 86).

As for the specialist teacher respondents, nearly all of them were teaching more than one technical course simultaneously when they responded to the questions. Of the 16 teacher respondents, 14 (87%) are male, and 2 are female (13%), ranging from 26 to 56 years of age. At the time of the survey, 56% of respondents were working in Electrotechnics, 50% were working in both Industrial Automation and Electronics and 37% in Electromechanics which corresponds to 50%, 42%, 42%, and 40% of the total number of teachers from each course, respectively.

Specialist teacher's language proficiency differs enormously from students' since 84% claimed they are able to read manuals, papers, and books in English, and 43% can understand conversations, professional presentations, and seminars. Most of the teacher respondents (62 percent) said they had prior hands-on experience in the course areas they currently teach, which means they can provide the additional language teacher with "background and insights into the kinds of practice that experts engage in" (HYLAND, 2007, p. 387) as well as which texts they use to communicate. Both groups had quite similar responses regarding the relevance of the English language and language skills. Not only specialist teachers

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[8] At the beginning of each semester, students can take a formal test to prove they already have the necessary proficiency in English. When that is the case, students are dismissed from the ESP course. In this study, only students who were not dismissed responded to the survey.

but also students consider English very relevant for professional purposes (100% and 79%, respectively). In terms of language skills, even though both language comprehension and production skills were considered relevant by both groups, teacher and student respondents rated comprehension skills, notably reading, (87% and 80%, respectively). This may be related to the fact that this particular question contextualized the ESP subject's situation in the curriculum of all four courses, which consists of only 36 hours and is offered in one single semester.

Surprisingly, the listening skill was also rated high by student respondents (54,8%), but not by teacher respondents (6,2%). One teacher stated that tutorials in video format had been increasingly used by students researching any specific professional issues online. This teacher said, however, that this search may be being conducted in Portuguese. Despite this fact, it seems that students would like to understand these materials in English.

The data from the first part of the questionnaires indicate some important issues for the ESP course designer. Students and specialist teachers can be essential informants when planning an ESP course requiring academic knowledge and professional experience. Data also suggests that English is an important language to be taught in the four post-secondary courses, especially the reading skill, and students' incipient knowledge of the language should be taken into account by the ESP teacher.

4.2. Genres

In terms of discourse genres, data were analyzed considering the four courses combined and then individually. Since the students' participation rates in the questionnaire were relatively low for two of the four courses (Electromechanics and Electronics, with a 6,5% rate each), the data generated by the teacher's questionnaire were used to analyze and double-check some specific responses whenever necessary.

Data is presented in two charts, each displaying students' (chart 1) or teachers' (chart 2) responses.

Chart 1 shows that instruction manuals or tutorials[9] were the most recurrent genres for 100% of student respondents, followed by safety notices and error messages from computer software (74% of respondents), informative texts (such as encyclopedia entries) (72%), data-sheets (61%), company

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[9] Tutorials are taken in this study as similar to instruction manuals, following the respondents' understanding of this genre (students and specialist teachers). According to Swales (1990), how members of a discourse community define a given genre is important for the analyst. Both manuals and tutorials seem to have the same purpose: to instruct the reader or the user on how to do something. One possible difference between the two genres may rely on the producer and the reader. Whereas instructions manuals can be usually produced by corporate professionals and are targeted at consumers of their products, according to Tarquini and McDorman (2019, p. 152), tutorials can be produced by a broader group: teaching staff in academic context or professionals from a corporate company, and increasingly more often by general users with practical knowledge on a given topic. The intended audiences of the latter include students, consumers, and users in general. Delving into other similarities and differences between both genres is beyond the scope of the present discussion.

websites (38%), and emails from/to vendors and suppliers (35%). Scientific paper was the least chosen genre by student respondents (3,2%).

Chart 1: Student's view on which genres they consider more important academically/professionally (multiple answers were allowed)
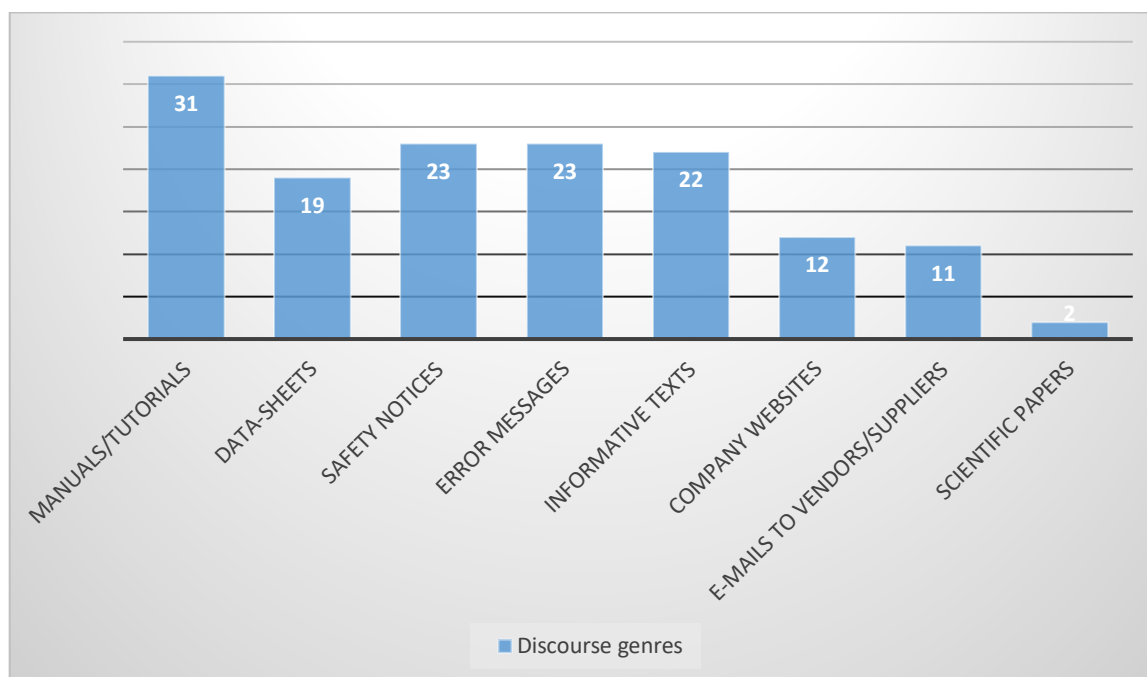
Source: authors

Teachers' responses to the same question show a slightly different scenario regarding genres, as shown in chart 2 below.

Chart 2: Teacher's view on which genres they consider more important academically/professionally (multiple answers were allowed)
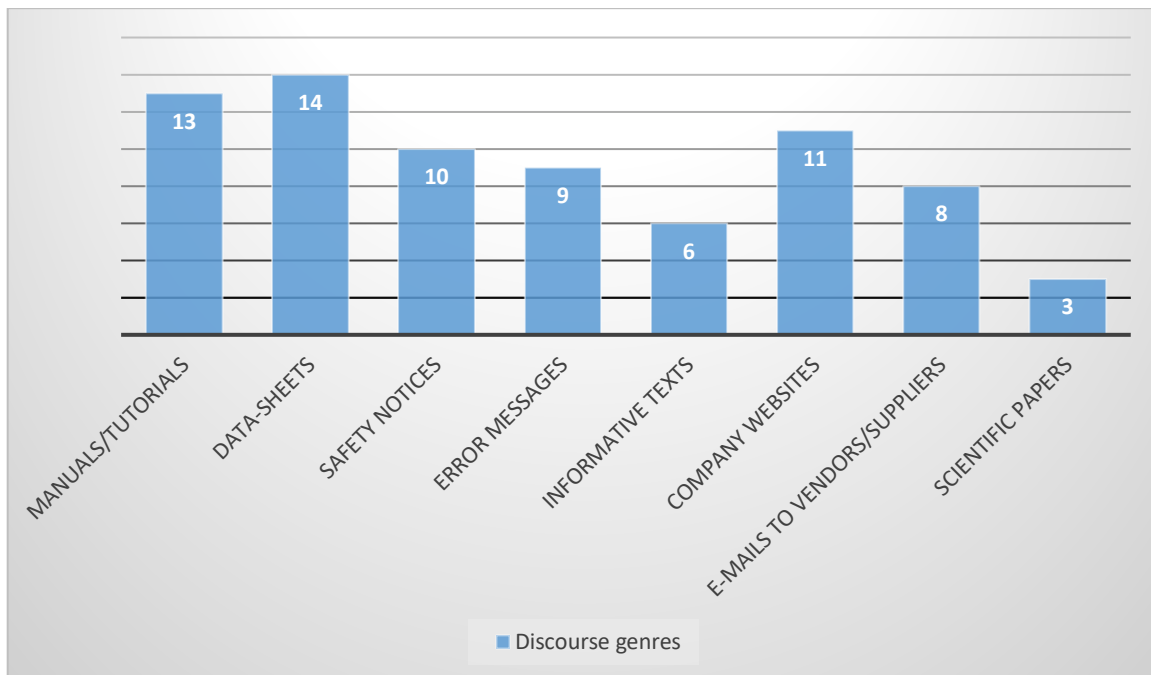
Source: authors

Differently from students' responses, in chart 2, manuals/tutorials were considered the second most recurrent genre within the academic and professional contexts by 81% of teacher respondents. In comparison, data-sheets[10] (87%) appeared as the most recurrent. However, when teachers' responses are analyzed separately by course, the data suggests that the latter do not have the same relevance in all four courses. However, this genre is critical in Electronics (100%) and Industrial Automation (80%), and to a lower degree in Electrotechnics (50%) and Electromechanics (12,5%). As for students' responses[11], when their answers were analyzed separately by course, the results were very similar to their teachers', indicating that the data-sheet genre is very recurrent in only two of the courses.

Although the recurrence rates of manuals/tutorials differ in charts 1 and 2, 100% and 81%, respectively, when the responses of both participant groups are analyzed separately by course, the data indicate that this genre is the most recurrent in three of the analyzed courses, except in Electronics, to which data-sheet appears as the most recurrent genre. Not only manuals/tutorials, but also data-sheets can be categorized as 'how-to' texts, having the purpose of instructing the reader/user on how to do something (TARQUINI; McDORMAN; 2019; GRUSIN, 2010). These figures indicate the practical orientation of technical courses, which traditionally focuses on hands-on tasks or practical knowledge (LAUDARES;

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[10] Data-sheet is understood by respondents as a kind of technical text that explains what an electronic component is, what it does and how to use it. A similar definition is given by Grusin (2010), an engineer who writes tutorials and science popularization texts about electronic projects for a website that was suggested by one of the teacher respondents.
[11] It was difficult to analyze students' responses separately by courses, since the participation rate of students from Electromechanics and Electronics was low (6,5%).

TOMASI, 2003). Such an orientation is corroborated by linguistic features used to describe most of the competencies these professionals must develop according to the pedagogical project of the four courses: *executing* [technical services; electrical and mechanical installations; electronic projects], *perform* [electrical measurements; calibrations of equipment, preventative/corrective maintenance of equipment], *test* and *troubleshoot* [equipment] (CTISM, 2018a, b, c; CTISM, 2019).

Safety notices usually displayed on industrial machines and equipment operated in the workplace are a recurrent genre for 74% of student respondents and 62% of teacher respondents. When analyzed separately by course, these figures remain similar. Although Brazilian safety norms[12] demand that safety notices in the workplace and machines and equipment must be displayed in Portuguese, many machines in-service student workers reported operating are imported. Thus English language notices may be present in the workplace.

A company website is a genre considered somewhat recurrent in all four courses by 75% of teacher respondents but by only 38% of student respondents. Teachers' high rate for this genre may be related to a course objective common to the four courses' pedagogical project, which states that graduates from the four courses should be able to prepare budgets that include the purchasing of materials, equipment, product installations, or maintenance, and provided service (CTISM, 2018a, b, c; CTISM, 2019). Two teacher respondents mentioned in the questionnaire that workers might sometimes have to search company websites to purchase machinery parts or equipment.

Similarly, answering/sending emails to vendors or suppliers is considered a recurrent genre by 50% of teacher respondents and by 38% of students. This genre seems to be related to the unfolding of the aforementioned objective: to contact vendors or suppliers to purchase materials and equipment after planning a budget. Another important consideration indicated by the genre is that writing may be a relevant skill to be taught, although not indicated in the first part of both questionnaires.

Error messages related to computer software were classified as recurrent by 68% of teacher respondents and by 74% of student respondents; the figures remain very similar when responses are analyzed separately by course. The need for considering this type of text may be related to the introduction of electronic and information technologies, which contributed significantly to the automation of the production processes in the industrial field since the 1960s as a consequence of the third industrial revolution, as pointed out by Laudares and Tomasi (2003) and Winckler and Santagala (2012). As a result, imported computerized devices and machines seem to be increasingly used within academic and

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[12] According to the Brazilian NR-12 safety norms, which establishes the safety norms for operating machinery and equipment in the workplace, safety notices must be written and displayed in Portuguese (Norm #12.119). Retrieved from: http://www.guiatrabalhista.com.br/legislacao/nr/nr12.htm. Access in August, 2019.

professional contexts, demanding that students and workers engage in this type of practice to perform a given task.

Informative texts (such as encyclopedia entries) were classified as a recurrent genre by 34% of teacher respondents and 72% of student respondents. The difference in terms of figures for this genre may be related to the fact that informative texts are already part of the current ESP syllabus, possibly influencing students' responses. Nevertheless, one-third of teacher respondents find this genre recurrent and important. Two of them mentioned in their questionnaire responses that students' knowledge of technical concepts and definitions might be expanded through English-written entries in encyclopedias, dictionaries, or websites.

The genre scientific paper was the least selected genre by both groups of respondents (18% of teacher respondents and 6,4% of student respondents). Research articles are usually produced in a "primary context of knowledge production" (HILGARTNER, 1990, p. 528), that is, the "academy and/or research centers" (HYLAND, 2010, p. 217). Since the post-secondary technical courses' learning context is more focused on hands-on practices (LAUDARES; TOMASI, 2003), this finding suggests that the research paper would be more suitable to academic-oriented contexts, such as undergraduate and graduate programs.

The genres presented and discussed so far indicate that practical knowledge is deemed very important in the four investigated courses, which may be observed in the high recurrence rates for instruction manuals/tutorials and data-sheets, whose purposes are either to instruct the reader on how to do something (TARQUINI; McDORMAN, 2019) or to instruct them on what an electronic component is and how to use it (GRUSIN, 2010). They also indicate the need for students to engage in genres that seem to be more related to technological and global economic changes, which have impacted the labor world, especially in the last decades (LAUDARES; TOMASI, 2003, p. 1240-1). As society becomes increasingly more technologized and globalized, technical workers in the industrial field may have to become better prepared not only to build, operate, and/or troubleshoot increasingly complex machines, but also be able to exchange information with international vendors or suppliers in order to buy products and machine parts to perform their jobs.

In the next section, we discuss some pedagogical implications of these findings for the ESP teacher.

5. Final considerations

We attempted to respond to the "what" of a course syllabus by mapping the most popular discourse genres in the four technical courses examined (HYLAND, 2006, p. 73). The implications of the findings help us reflect upon and decide on implementing the "*how*" of a course design.

Regarding the "what" of a course syllabus, the findings show that genres focused on hands-on tasks (instruction manuals, tutorials, data-sheets, safety notices) are predominant in the four courses, corroborating the practical orientation of technical courses in the industrial field. Data also show that genres that mediate the relationship between companies and technical workers (company websites and emails to vendors or suppliers) are deemed necessary among respondents since they can help workers to perform tasks considered important in a globalized and technologized world (search and purchase machinery parts and equipment, for example). Additionally, genres that help students better understand and expand their knowledge of important technical concepts (informative texts such as encyclopedia entries) as well as deal with computer and/or machine software more successfully (error messages) are also considered relevant, the latter mainly due to the increasing use of new technological devices in the industrial sector (WINCKLER; SANTAGALA, 2012).

The "how" of a course syllabus is the following step in designing an ESP course and teaching materials. In order to implement course design based on the genres mapped, it is necessary to carry out a context-level investigation to assess how students/workers consume these genres. Some of the questions raised from our findings are: to what extent do students/workers in each course regularly engage with the genres? Do they have to read the entire text, or do they focus on specific pieces of information? As mentioned by one student in the questionnaire, not all the sections of a manual are equally relevant; depending on the work to be done, some sections may be more important than others. A similar note was made by one of the teacher respondents in the questionnaire regarding the data-sheet genre. According to this teacher, this genre may have 30 or 300 pages, depending on the electronic component it describes. However, only a few pages with some specific information must be read by the student/worker. This information suggests that "professional discourses are not uniform and monolithic differentiated only by specialist topics and vocabularies" (HYLAND, 2007, p. 388), or by genres taken as a whole, we must add. Therefore, investigating how such genres are consumed by the discourse community formed by students and workers in the four courses can certainly better inform a pedagogical approach to them.

The next step of this study, implementing the *how* phase, consists of collecting samples from the genres that were mapped as well as analyzing them to identify their prototypical rhetoric and linguistic features, which can be used to inform both the ESP course syllabus and teaching activities. The prototypical features enable us to identify moves and steps in the genres (SWALES, 1990) at a broader level and frequent lexicogrammar aspects at a narrower level. The Corpus Linguistics research field can

offer one helpful approach to the mapping at a narrower level. A valuable tool for researching in this field is AntConc, a "freeware, multi-platform, multi-purpose corpus analysis toolkit" (ANTHONY, 2004, p. 7) that can be used to find patterns of grammatical use or frequently recurring words and phrases in large sets of texts. The mapping and analysis of these features in terms of prototypicality and frequency can certainly offer meaningful insights into the genres and therefore inform the course design and the production of teaching activities.

In brief, we have mapped the most popular discourse genres in four technical courses. The results indicate that genres based on hands-on activities (instruction manuals/tutorials, data-sheets, and safety notices) are prevalent in the four courses, confirming the industrial field's technical orientation. Further study on collecting samples and assessing the genres mapped in this study is necessary to determine features that can inform both the ESP course syllabus and teaching activities. This needs analysis is worth discussing with other colleagues and peers due to the importance of teachers performing action research in their classrooms and contexts. We enthusiastically support that the most successful pedagogical improvements are likely to occur when the actual ESP field practitioners, teachers, engage in action research regarding the specificities of their teaching context.

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