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ARTIGO ORIGINAL

CLIL in Education for Science: a case study in a (post-) graduate program

CLIL em Educação para a Ciência: um estudo de caso em um programa de pós-graduação

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Abstract: Content and language integrated learning (CLIL) has a long tradition in European countries, especially in primary and secondary education. In this paper we draw attention to the limited use of the term in higher education, especially at (post-)graduate level. By describing and discussing a course entirely taught in English to students in a program titled Education for Science in Brazil, the authors expect to contribute to a broader understanding of the interrelations between specialized content and advanced communicative skills in English for academic purposes. By focusing on qualitative data on the collaborative writing of a paper in English, it is expected that this kind of classroom-based case study will contribute to better informed decisions related to internationalization of (post-)graduate programs among institutions that underscore the importance of English to help promote visibility and cooperation.

Keywords: English for specific purposes; (Post-)graduate education; Academic language functions.

Resumo: A aprendizagem integrada de conteúdos e de línguas (AICL) tem grande tradição na educação básica europeia. Neste artigo chamamos atenção para o uso indevidamente limitado do termo no ensino superior, sobretudo na pós-graduação. Ao descrever criticamente ações em uma disciplina num programa de pós em Educação para a Ciência, integralmente realizadas em inglês, buscamos contribuir para uma compreensão mais ampla das inter-relações entre conteúdos especializados e competências comunicativas avançadas em inglês acadêmico. Com base em dados qualitativos sobre a escrita colaborativa deste artigo em inglês, esperamos que o estudo de caso em sala de aula possa promover decisões mais amadurecidas quanto à internacionalização de programas de pós nas instituições que enfatizam a importância da língua inglesa para a visibilidade e cooperação acadêmica.

Palavras-chave: Ensino de inglês; CLIL; AICL; Educação para a ciência; Ensino superior.

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Introduction

This paper is a report on a hands-on CLIL task involving five participants: two master's and two doctoral candidates in a (post-)graduate[1] program in São Paulo state, Brazil, titled *Educação para a Ciência* (Education for Science), and the instructor of a 60-hour course that has been taught in English in this program since 2019, i.e. *Language Matters in Science Education*.

The rationale for the work was that a combination of smaller tasks would provide a realistic opportunity to analyze the effects of CLIL on higher, graduate education. First, the collaborative reading of a specific chapter on academic language functions (DALTON-PUFFER, 2007), then group discussions of the content in that chapter in light of previous readings and reflections during the course, and finally a systematic procedure for the participants to record their impressions and ideas throughout the processes mentioned above, plus the preparation of a manuscript. More objectively, this classroom research has been conceived as a qualitative case study centered on the following question:

> *In the process of studying academic language functions (chapter 6 in Dalton- Puffer's book) and drafting a manuscript, what are participants' considerations about CLIL in the (post)graduate course 'Language Matters in Science Education'*?

Language Matters in Science Education is the only course that is entirely taught in English in the specific program offered by the School of Sciences of São Paulo State University. In the end, the actual writing of the manuscript was the collaborative work of the two doctoral candidates and the instructor, who are therefore the coauthors of the paper. Nevertheless, the other participants have allowed the authors to use the data collected in the case study, and their decision not to be coauthors was due to lack of time or other personal reasons that prevented them from making actual contributions to the writing of this paper.

The year 2022 marks the tenth anniversary of volume 25 of AILA Review, whose main title is *Integrating Content and Language in Higher Education* (SMIT; DAFOUZ, 2012). The volume is a collection of six papers addressing English-Medium Instruction in European Universities. In passing, there is one reference to Brazil in the entire volume: a participant in one of the described studies is a Brazilian student.

CLIL (content and language integrated learning), ICLHE (integrating content and language in higher education), and EMI (English as a medium of instruction) are recurring terms throughout the book, and it seems that terminology issues still require critical discussion. Particularly in the case of Brazil, even though internationalization has gained increased attention from faculty, administration and funding agencies, the teaching of foreign languages remains marginal. Outside undergraduate programs in language teaching, literature, translation, and linguistics, 'teaching foreign languages' means the teaching of English. That is also true of the absolute majority of graduate programs.

In this context, we expect that this paper will help shed light on the main principles of CLIL and why it is an adequate term to describe approaches to education in which language and content are viewed as inseparable components, regardless of student age,

[1]We have chosen to use the term 'graduate' from now on, except in the wording of the research question.

level of education, and – why not? – the target language being an additional one (foreign), or specific variants of (registers in) the mother tongue that are particularly suited for specialized communication. In addition, this case study may provide an inspiration for faculty and administration interested in exploring ways to implement CLIL, and the challenges involved in such an endeavor.

A survey into Scopus, Scielo and databases provided by Capes, using a combination of the terms CLIL, ICLHE, EMI, graduate education, and Brazil over the last 5 years has led to the identification of 23 papers, 2 books and 2 conference proceedings. A study of the abstracts revealed that both books and both proceedings focused on a range of aspects of teaching an additional language (English in most cases, through CLIL) in secondary, and higher education to undergraduates. In the case of the papers, the focus on higher education prevails (19 papers out of 23), but only a handful of studies concern education at graduate level (5 papers out of 19).

Before getting into the details of the studies related to graduate education, an overview of the other papers is provided. Out of the 5 articles in Scielo, only 2 relate to university programs (German/Portuguese Language Arts; and EMI trends in Brazilian higher education in general), whereas 1 is about bilingual programs in secondary school, 1 deals with intercultural competence in primary education, and 1 concerns the acquisition of listening skills in primary and secondary education. With or without the term Brazil in the search, among the 5 papers located in the Capes databases, 1 focused on Public Administration in Russia, the abstract of 1 study conducted in Portugal does not specify the programs followed by the participants, 1 study in Spain concerns Law and Business, 1 has been conducted in Tourism CLIL classrooms in Ecuador, and 1 has been completed in Russia with future teachers. In addition, 1 paper found in Scopus dealt with high school in Canada, and 7 articles focused on a range of countries (Indonesia, Romania, Russia, Spain, Taiwan, and Thailand) and undergraduate programs (Engineering, Hospitality and Tourism, Mathematics, Teacher Education, and Technical Training). Finally, 1 paper (GIMENEZ; CALVO; KADRI; MARSON; KADRI, 2021) focuses on the EMI trends in Brazilian higher education in general, as it has been mentioned above.

Five papers have been found with stronger relevance to this article because of the focus on graduate education. Adamson, Coulson and Fujimoto-Adamson (2019) describe a study with undergraduate and graduate students in Japan who were being tutored to write their theses/dissertations. According to the authors, their teaching was informed by EMI and CLIL, but theirs is a report that focuses especially on process writing in academic English rather than the content in the participants' research. Avkhacheva, Barinova and Nesterova (2020) have investigated stylistics in academic writing in English, particularly hedging and understatement in scientific discourse, by looking at the awareness of researchers and master's degree students of a polytechnic university in Russia. Thus, the primary focus of the study is also academic English. Banegas (2021) reports on a study on the impacts of systemic functional grammar (SFG) on student-teacher's professional development in Argentina. The participants in this classroom research were following a pre-service course to qualify as second language teachers. The course was conducted in English and is described by the author as favoring CLIL. In this case, the study is primarily concerned with content (SFG). Along the same lines, Laborda and Peñalver (2019) also focus on teacher education and compare CLIL teaching practices with undergraduate and graduate students in Thailand. Strongly tied to internalization, the rationale in their study was to look at CLIL instruction

provided to faculty conducting EMI courses to local students, and then compare the teaching strategies employed by those instructors in undergraduate (Anxiety Disorders and Insomnia) and graduate (Seminar on Biochemistry) classes. Finally, another study conducted in Thailand (WONGSOTHORN; YORDCHIM; THITIVESA; PONGSURAPIPA, 2019) has looked at teaching that is conducted in English at graduate level. In this research, however, the central interest is in assessing teachers' and doctoral students' perceptions on the use of media to teach English as an international language. Both groups of teachers and doctoral students have practical experience with EMI because of the teaching they have provided or received in the foreign language.

The following section of this article provides a review of the tenets of CLIL to argue that content and language integrated learning, as an approach, should not be confined to bilingual/child/pre-university education (Theoretical-methodological underpinnings). Next, the paper deals with the research procedures, the data, and the main conclusions.

Theoretical-methodological underpinnings

Definitions of content and language integrated learning (CLIL, AICL in Portuguese: *Aprendizagem Integrada de Conteúdos e de Língua*) may appear in different wording in the specialized literature, but the recurring terms are indisputably **situations/contexts/an approach** in which **an additional/a foreign language** is used **in dual-focused ways/as a medium** for teaching and learning both non-language **content and language** (COYLE; HOOD; MARSH, 2010; MARSH, 1994; MARSH; MARTIN, 2013).

Situations and contexts are interchangeable and apply to the settings in which teaching and learning are taking place. The term approach (ANTHONY, 1963), in Educational Linguistics, is most often used to refer to how theories (implicit and explicit), beliefs and experiences (practice and praxis) affect the decisions, routines and techniques in teaching something. In other words, an approach (at the level of abstraction) will determine the procedures (concrete events and tools) in teaching- learning processes. Thus, CLIL should not be viewed as a method *per se*; it must – rather – be understood as a collection of principles centered around the indissociable relationship between language and content, and the implications of such a bond for learning and teaching. So far, so good: dual-focused, teaching and learning, and content and language have been accounted for.

The use of the terms additional/foreign language, [language as] medium, and *non- language content* call for more careful consideration. It is a fact that the first L in CLIL – in the European scene, where the acronym was coined – can be assumed to imply an additional/a foreign language. It is also a fact that *that language* was – for many, many years – essentially English. However, things have changed and – especially due to the growing multilingual and multicultural communities in (larger cities in) many countries, CLIL has attracted the attention of educators and policymakers for its potential to deal with official languages, and the language(s) of schooling. Some examples are Austria, Italy, Spain, and The Netherlands among others (CONCÁRIO, 2018).

First, more careful consideration is necessary because the indissociable relationship between content and language is such that *language* could be interpreted as *any language*, instead of exclusively an additional/a foreign language. Accordingly, CLIL – as an approach – has the potential to contribute to promote language (in) teaching and learning also in mother-tongue contexts. Second, even though terms like *non-language content* and

language as a medium for teaching and learning may be justifiable for pedagogical reasons, *non-language content* is a paradox, whereas *a medium* may cause the unhelpful impression – at least from the point of view of language specialists – that content is the ultimate goal.

To go back to one point made in the introduction of this paper, the authors wish to underscore how the key rationale in CLIL – language and content being integrated – can be explored in education in general. Content hinges on language, and any language hinges on content. In the case of Science Education, or Education for Science, there could be a focus on the languages of/for sciences, and specific agendas could be set – for instance – for child education, secondary school, and at university level. In the specific case of this article, there is an interest in CLIL in graduate education. Incidentally, the L is a foreign language: none of the authors are users of English as a first language.

In this regard, this is a typical case where CLIL refers to a dual-focused way in teaching and learning content (academic language functions, language use in instructional interactions, academic writing) and language (academic English). What can be considered innovative in our work is the fact that it is an instance of CLIL in graduate education, particularly in the Brazilian scenario.

As a case study, there is a strong focus on describing the context, the participants and the procedures in our collaborative classroom inquiry (NUNAN, 1992). The nature of the study is exploratory, and the data are qualitative, comprising journal entries and written essays produced by the participants (especially the authors of this paper) as we studied a specific chapter in a graduate course, and as we wrote this article collaboratively. As a result, the analysis of the data involved reading, identifying, and discussing the authors' reflections on how each participant felt that both the reading of the selected book chapter, and the drafting and the revising of the manuscript that culminated in this paper, influenced their perceptions about CLIL in the graduate course.

To our knowledge, no study like this has been conducted in Brazil. We have found a very small number of research reports on CLIL and graduate education even abroad, and the few studies we have been able to review apparently do not capitalize on the difference between CLIL and EMI (English as a medium of Instruction). Whereas CLIL centers on dual focus, EMI – by definition – explicitly regards English as a means to deal with *non-language* content. Consequently, focus on *the* language of instruction is less prevalent. Notwithstanding these differences, our search for bibliography on CLIL, EMI and higher education in Brazil has led us to one doctoral dissertation (BAUVOL, 2018).

In her research, Bauvol acknowledges the scarcity of studies about the Brazilian context and the use of English in graduate courses, research, and publications. The study deals with quantitative and qualitative data, shows that the use of English is more marked in hard sciences, and that scholars in these fields have self-rated their proficiency in English more highly. The dissertation also addresses how a significant number of scholars – regardless of disciplinary areas – have reservations about teaching their courses in English. Again, it is clear that the present article represents a different perspective, and we expect our classroom-based case study can contribute to and stimulate other investigations concerning specialized language and content, in higher education, as an instance of CLIL.

Research procedures

The research design is a qualitative case study conceived to analyze the effects of CLIL according to five participants in a graduate program at São Paulo State University. The participants, including the 3 authors of this paper, are: two master's degree students (who are not coauthors), two doctoral candidates and the instructor of the course *Language Matters in Science Education*, which is taught in English in the Education for Science program.

The course instructor is professor of English for specific purposes, and the students are very competent users of English. The average level of proficiency may be considered C1 or higher (Common European Framework of Reference): one doctoral student has completed most of her schooling in the United States, whereas the other holds a degree in Languages. One of the master's degree students claims to have learned English on his own, mostly in informal settings and by listening to music, watching TV shows and movies, and playing games. The other MA student has learned English in language schools in Brazil, has some experience as a language instructor herself, and has used the language abroad. All the participants are first-language speakers of Portuguese and were born in Brazil, where they completed their degrees and – in most cases - attended private language schools to learn English before any experience abroad.

The students' academic backgrounds are diverse, with undergraduate degrees as follows: Biotechnology and Bioprocesses Engineering, Physics, Modern Languages (Portuguese and English), and Pedagogy (Early Childhood Education). Despite the different backgrounds, now as graduate students their common goals relate to science teaching and/or science communication, which explains their enrollment in the course *Language Matters in Science Education*.

The graduate students attended the 60-hour online course between August and November 2021, meeting once a week for sessions grounded in CLIL. Throughout the semester, the participants read and discussed papers on the topics of language, scientific literacy, science education and science communication. Therefore, the interrelations between language and specific content in learning were the backbone of the course.

In order to achieve the goal in this classroom study, the participants engaged with a series of tasks, including the initial collaborative reading of a specific chapter on academic language functions (DALTON-PUFFER, 2007), and group discussions of the content in that chapter in light of previous readings and reflections during the course. In view of the research question, the participants recorded in a journal their impressions and ideas throughout the processes mentioned above, particularly regarding the integration of content and language (English) when studying academic language functions and working on different versions of this paper. Subsequently, the participants' personal journals were collected for analysis and categorization of their considerations to deal with the research question.

This process of analyzing and categorizing qualitative data involved critical reading of the journal entries to identify specific comments about the content in Dalton-Puffer's chapter, the experience of reading that text, how each participant responded to the language (lexicogrammar, style, organization - academic English), and their feedback on process writing – the work on the manuscript that resulted in this paper. The procedures

are compatible with content analysis, and interpretive categories were established through recurring patterns in the data.

The preparation of this paper involved collaboration among the authors/participants. Data analysis and the drafting of the section on research procedures started with 2 participants each, and 1 author took on the drafting of the introduction/theoretical framework. Collaborative, asynchronous review of the initial versions of the text lasted for a period of 5 weeks, which was important to review and rewrite specific portions of the article and validate most of the analysis. Finally, two synchronous collaborative sessions helped to plan and draft the conclusions and the abstract, after a discussion of the longer sections in the paper.

The role of the instructor as an experienced CLIL practitioner certainly meant some leadership in the process of proposing steps and activities throughout the work, including questions and prompts to the students. However, this does not mean the collaboration was unevenly distributed. Rather, it means that equity is a principle that has permeated the execution of our case study based on a classroom experience: the actual work on the manuscript started when the course had been officially completed, and all grades and attendance levels had been formally filed.

Therefore, the current version of this article reflects the authors' latest ideas motivated by the research question at the time of submission to the journal. These ideas may include considerations about teacher and student roles, power issues, and authority in science communication.

Data and discussion

This section of the paper deals with the main considerations of the authors/participants concerning the research question:

> *In the process of studying academic language functions and drafting a manuscript, what are the authors' (of the manuscript/participants) considerations about CLIL in a (post)graduate course 'Language Matters in Science Education'?*

Three broad categories have been advanced to accommodate participants' responses and comments regarding the research question: (1) references to source(s), (2) references to CLIL, and (3) references to agenda. The table below provides details on the types of references in each category that were identified in the data.

Table 1 – Main categories and types of references in the data

1. Refences to source(s)	1.1. explicit reference to Dalton-Puffer's chapter 1.2. explicit reference to other sources 1.3. use of keywords/terminology studied in the course
2. References to CLIL	2.1. emphasis on language aspects 2.2. emphasis on content dealt with in the course 2.3. explicit comment on the integration of content and language
3. References to agenda	3.1. comments on personal preferences/interests/needs 3.2. concern for professional/practice issues 3.3. concern for research issues

Source: Prepared by the authors.

Excerpts from data that relate to agenda are: "[...] *as an elementary school teacher, I understand that language teaching as a means to learning, is fundamental in the educational process*"; "[...] *it has also become a goal* […] *for future research to deepen my personal understanding of 'languaging' as a possibility to participate through the social use of language*"; "[…] *focused on my own research and on my PhD objectives. I have furthermore made use of the material to develop my … proposal. My research emphasis on Science Education and Language has been grounded in/on topics around* […]"; "[...] *pulled these ideas and concepts together in order to strengthen my theoretical and practical knowledge*"; "[...] *also applied to the context I live (to write scientific reports, manuscripts and to read scientific contents in English) contributed to my evolution during the course*". A longer exemplar can also illustrate the interests of a participant in the work of teachers, even though it has not been worded in the form of first-person statements:

> *Accept that the role of the teacher is that simple, and that common will make it just a job, there isn't any problem with having just a job, but in the case of teaching it reduces the possibility even for new teachers that will go to the college and see it as just a job. What if those new teachers don't even know what they are capable of? How many lives will not be changed? Maybe with it we just don't motivate enough someone who would have discovered a new technology or a cure to a disease that would save lives.*

Although this is a case study with a small number of participants, an interesting phenomenon has been verified that is certainly worthy of further investigation in the context of CLIL in graduate education: most participants have acknowledged that their initial interest in the course was the fact that it was taught in English (2.1); however, the most elaborate comments on the course while addressing the research question dealt with content (2.2). Some excerpts that show this are:

> *I was excited by the opportunity to attend a class in which I would be able to practice English. That was my initial goal: developing my English language skills, on a higher level, and aiming at the possibility of acquiring more knowledge in science communication. Nevertheless, at the end* […] *developing* […] English […] *has been just part of greater learning,* […] *classes have been essential for enhancing academic and lifelong abilities* […] *teacher training, scientific literacy…*
>
> *… different from the others, all of the names* [course titles] *were in Portuguese with only this exception. I was surprised… I've spoken to my advisor and asked what his opinion about this class… I was hoping for a yes, and that's what he said.*
>
> *I don't remember if I ever had to write something for real in English before this masters… That's one of the reasons why the course was important for me. Here I was able to express myself… That freedom in the class even during the online classes made me don't be so ashamed, I feel like I would not be so judged by some pronunciation or syntax error…*
>
> *I'd say that 70% of what I've learned went into content and 30% into language because I had to study new concepts and terms…*
>
> *…being aware of the patterns of language that enable different fields of study to produce content and language… content literacy and disciplinary literacy* […] *mediation to favor student production* [language for science].
>
> *… the balance between content and language* [English], *I would rate that 80% of what I have learned in this course relates to content, and 20% to language.*

Finally, regarding reference to source(s), 2 participants made a significant number of explicit references to Dalton-Puffer's chapter and other texts we studied in the course. These included citations, for example:

> According to her, a synonym is actually a superordinate of the term to be understood/learned/explained […] mediating student production requires that the [science] teacher ask specific types of questions [open questions, questions for opinions, reasons, and explanations] rather than questions for facts… Dalton-Puffer (2007) further states that…
>
> Returning to Lemke (1990), "[...] language may not be the whole of the means by which we do science […] ". Like every other field of human activity, its content knowledge is communicated and jointly constructed between teachers and students.

On the other hand, even though no citation or explicit reference to the work of specific authors appeared in portions of data, some excerpts do include keywords and phrases that have been the object of study in our sessions:

> [...] *where my own research meets the input of the course*.
>
> *… the teacher also fills in the gaps that required deeper explanation to construct models that allow students to have a sense that they have participated in the building of the definition of the concept…*

Overall, all students found the experience challenging but rewarding on both personal and professional levels. That means that certain ways in which language and content were used in the classroom helped students to acquire competences in English (foreign language learning) as well as in academic language functions (content). In other words, students have benefited from the study of academic language functions in English put forward by Dalton-Puffer (2007), such as analyzing, classifying, comparing, defining, describing, drawing conclusions, evaluating and assessing, explaining, hypothesizing, informing, narrating, persuading, predicting, requesting/giving information.

However, some of these functions seem to have been experienced/practiced more than others in our CLIL course. That is probably due to the focus of the course on science education. In this regard, the CLIL course has promoted the use of the target language to mobilize concepts, topics, and meanings, thereby encouraging naturalistic language learning and enhancing the development of communicative competence in the foreign language. As Dalton-Puffer (2007, p. 3) outlines, "CLIL classrooms are seen as environments which provide opportunities for learning through acquisition rather than through explicit teaching". Moreover, language learning and language use are particularly critical for the development of mental structures as learners have the chance to deal with new tasks and experiences in CLIL classrooms.

Furthermore, the CLIL course as a language learning environment has brought some reflections on at least two types of learning theories: constructive and participatory learning. According to Dalton-Puffer (2007, p. 9), both theories highlight "[...] the importance of the social embeddedness of CLIL education and the significance of the learner group and their transactions within their educational speech community". Among many issues concerning language in science education, the course also dealt with the crucial role language plays in the construction and refinement of concepts within a specific context, namely in the science classroom. Similarly, Dalton-Puffer (2007, p. 308) reinforces that "[...] language curricula for CLIL should be developed, and language goals in speaking, writing, reading, and listening concretized". It is important to bear in mind that "[...] in order to fully exploit the spectrum of linguistic possibilities available within the confines of classroom talk, it would be advantageous to conduct not only instructional but also regulative phases of the lessons in the target language." (DALTON-PUFFER, 2007, p. 309).

It is worth noting, too, that 3 of the 4 students in the graduate program are teachers involved with science education, though at different levels (elementary, primary, and high school). In that respect, the students were constantly encouraged to look at language and content in a particular way, which is an asset in "our" teaching practice. There is, therefore, a shared experience about the use of language as social practice constructed by and with their users. This suggests that graduate students with different backgrounds (e.g., law, accounting, or geography) would probably have had different insights about how language and specialized content inter-relate.

Furthermore, in our case, the 4 students and the professor are Portuguese L1 speakers, which allowed for negotiating meaning that also impacted on our ways of using the first language (for instance, while preparing to ask for clarification, paraphrase, and provide synonyms). In other words, there was a genuine CLIL environment that helped practice and refine academic communication both in English (the medium, the target language), and Portuguese (mostly at a personal level, practiced 'in silence', or privately).

Finally, the graduate students had the opportunity to learn and practice terminology during the CLIL sessions by reading, writing, listening and speaking about language and content. This was felt to be useful in specific parts of the research currently being carried out by each participant in the course, including the professor. In addition to these skills, academic knowledge was developed by using English in the field of science education, as advocated by Marash, Maliers and Hartiala (2001 apud MOGHADAMA; FATEMIPOURB, 2014, p. 2005), who state that "[S]tudents cannot develop academic knowledge and skills without access to the language in which that knowledge is embedded, discussed, constructed, or evaluated. Nor can they acquire academic language skills in a context devoid of [academic] content."

When it comes to classroom discourse, for example, some aspects regarding academic functions were addressed in the course. The roles of questions and responses are constitutive elements in the production of classroom language as they are part of the construction of knowledge and the organization of classroom procedures. Despite the course being conducted online due to the Covid-19 Pandemic, there was close interaction among the participants and the professor, which further enhanced the potential for CLIL. In pedagogical terms, for instance, Dalton-Puffer (2007) looks at her own working models for these three academic speech functions: defining, explaining, and hypothesizing. Her main findings not only lead to conclusions about the context of Austrian CLIL classrooms, but also serve as a basis for discussing possible implications for pedagogical practice in other educational contexts, as this paper has outlined.

Conclusions

This paper reports on a hands-on case study in which the participants have collaborated to investigate the perceived impacts of CLIL in a specific course titled *Language Matters in Science Education*. The analysis of qualitative data collected while working on a specific course task, which culminated in the writing of this manuscript by 3 participants, has shown that the motivational aspects of CLIL are also present in this case, which coincides with the specialized literature and numerous reports on CLIL initiatives.

MA and doctoral students in this case study have become interested in the course at first because it was offered in English, which consisted in opportunities to practice and develop special language skills. However, during the course – and especially while

addressing the research question – most of the data generated by the participants concerned the specialized content that was addressed in the sessions, which suggests a stronger perception of content learning in the end. In addition, the data contain reference to the specific chapter that had been chosen for the task, some explicit reference to other sources studied in the course, and repeated occurrences of keywords and concepts that constitute actual learning goals. In addition, the data show that participants acknowledge the contributions of the course (CLIL) regarding their interests and needs at present – or in the future – both in terms of work and research.

Moreover, the hands-on nature of the task, and the collaboration in the planning, drafting and reviewing of this paper represent, to the best of our knowledge, innovative experimentation with CLIL in graduate education. Unfortunately, the master's students were unable to contribute to the actual writing of the manuscript for personal reasons, which essentially concern lack of time and other priorities related to work and/or the commitment to their individual research projects. We have enjoyed the challenge in finding ways to offset the potential risks of power imbalance that are typical of classroom research, when instructors and students work together, and when unforeseen events may affect the completion of tasks as originally intended. This is particularly the case of the manuscript, which had initially been planned as a collaborative enterprise among the 5 participants, and – eventually – has been coauthored by the instructor and both doctoral candidates.

Despite the professor's repeated requests to the other participants for explicit comments on the experience of collaboratively writing this paper, there has been virtually no such feedback. This means that robust conclusions cannot be drawn in that respect, and some ideas can be offered concerning future investigations to fill this gap: (1) similar case studies could be planned in which data collection and analysis are not both conducted with the participation of the course instructor; (2) collaborative writing of a manuscript could also take place without the participation of the course instructor; (3) finally, specific tasks can become part of the research procedures, in which sample parts of the manuscript are explicitly compared with revisions and comments from other participants, including feedback from more experienced researchers – this would then become a formal, explicit, and mandatory procedure to collect more data from the coauthors (by a 'non-participating' party).

Even though there were discussion meetings to follow up on the writing of this paper, which included questions and feedback from the professor concerning the organization of sections, paragraph/sentence structure, lexicogrammar, and the content itself, this kind of feedback seems to have been incorporated by the doctoral students without negotiation. On the other hand, no instance of question/suggestion/correction has been offered to the professor despite changes that have been found to be necessary in the manuscript, including spelling, word choice, and paragraph and sentence structure. Despite these limitations, we sincerely hope that the detailed description of every step taken along the case we have reported on can encourage other studies about the indisputable integration of language and content in learning and development, particularly in academic communication at graduate level.

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