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The Language Quadriptych in content and language integrated learning: findings from a collaborative action research study

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ABSTRACT

In this study, we report the findings from a collaborative action research project carried out between three secondary school teachers (Biology, History, Literature) from a Spanish-English bilingual school in Argentina, and Author 1. The project emerged in response to the teachers' interest in providing their learners with further opportunities to use English as an additional language in the content and language integrated learning (CLIL) classroom. The experience included a series of workshops on lesson planning and reflection around the Language Triptych (Coyle et al. 2010. *CLIL: Content and Language Integrated Learning*. Cambridge: Cambridge University Press). Data were collected through classroom observations, teaching and learning artefacts, and interviews with the participating teachers. Data were analysed through qualitative content analysis. We particularly pay attention to how the participating teachers put forward what we shall call the 'Language Quadriptych' to account for their learners' linguistic and cognitive needs and wants in relation reflecting on their learning, alongside constructing disciplinary knowledge in English.

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Introduction

Various approaches have been implemented with the aim of integrating curriculum content and additional languages. One such approach is content and language integrated learning (CLIL), which can be minimally defined as 'a dual-focused approach in which an additional language is used for the learning and teaching of both content and language' (Coyle, Hood, and Marsh 2010, 1). CLIL continues to gain traction in bilingual education around the world given its purported benefits to learners' academic trajectories and engagement (e.g. Coyle 2018; Fazzi and Menegale 2023; Martínez Agudo 2021; Tarrayo and Hernandez 2023).

With the aim of helping teachers support language development in CLIL, Coyle et al. (2010) have suggested a pedagogical tool called the Language Triptych (explained below). As we argue below, this tool can harness cognitive discourse functions, henceforth CDFs (Dalton-Puffer 2013, 2016), which is another potent tool to support learners' language development in CLIL. The Triptych has also proved to be valuable for continuing professional development (Banegas, Montgomery, and Raud forthcoming). While we recognise that there is a dearth of studies which examine how the Triptych is used as a pedagogical tool by teachers in their CLIL practices, this study emerged from a necessity in practice as described below.

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In this study, we report the findings from a collaborative action research (CAR) project conducted between three secondary school teachers from a Spanish-English bilingual school in Argentina, and Author 1. The project emerged in response to the teachers' interest in providing their learners with further opportunities to use English in the classroom. The experience included a series of workshops on lesson planning and reflection, built around the Language Triptych. In this paper, we describe how the participating teachers put forward what we shall call the 'Language Quadriptych' to support their learners' linguistic and cognitive needs and wants.

Conceptual background

This study is primarily based on the notion of the Language Triptych, and to a lesser extent on CDFs. The Language Triptych (Figure 1) was proposed by Coyle (2007) as a pedagogical tool for making sense of the language learning and language use that takes place in the L2 content classroom (Coyle, Hood, and Marsh 2010). The focus of the Triptych is on function and meaning-making rather than on progression through a predetermined grammatical syllabus. The Triptych addresses three types of language: subject-specific language (e.g. specific terminology, frequent syntactic structures) needed to understand and communicate subject content (Language *of* Learning, LoL); transactional/classroom language needed in order to communicate and negotiate meaning in the classroom as learners complete the activities assigned to them, but not linked directly to subject content (Language *for* Learning, LfL); and language that emerges through learners' use of the language as a vehicle for learning (Language *through* Learning, LtL). The latter will likely be different for every learner, meaning that the teacher's role is to create an environment in which learners are stimulated to actively use and notice language at an appropriate cognitive level (Coyle 2007). It should be noted that general academic language can be present across the three elements of the Triptych since learning occurs in the context of the school curriculum.

Coyle et al. (2010) argue that the Triptych can help teachers develop systematic understanding of the role of language in their teaching, described elsewhere as teacher language awareness (Andrews and Lin 2018). However, van Kampen et al.'s (2018) review of research on teachers' observed and self-reported CLIL practices led to the conclusion that CLIL content teachers do not always pay explicit attention to language in their teaching. Furthermore, Morton (2020) observes that CLIL teachers often focus primarily on LoL, as it is closest to the familiar domain of their subject area, and perhaps because they do not feel equipped to address the more general language covered by LfL and LtL. Findings such as these suggest that, while the Triptych could, as Coyle (2007) envisaged, provide support to teachers in scaffolding learners' language use and content development, its full potential in this regard has not been achieved.

Nor has the Triptych's potential been thoroughly investigated. While it has been used as a planning tool (e.g. Coyle 2015), in teacher education (e.g. Kao 2022; Turner and Fielding 2021) and as a

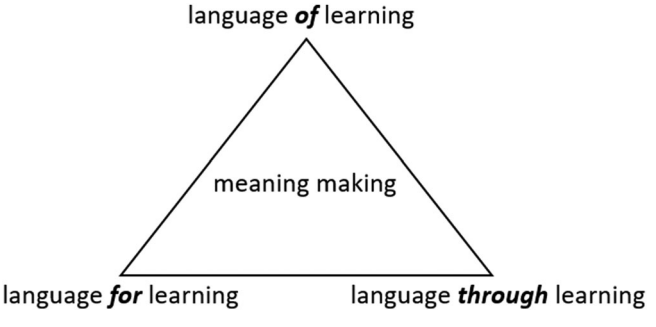


Figure 1. The Language Triptych (adapted from Coyle and Meyer 2021, 26).

theoretical model for CLIL (e.g. Mariño Avila 2014; Morton 2020), the model has undergone little empirical exploration. The research that has taken place has concentrated on implications for teacher education and professional development. For example, Martín del Pozo (2016) used the Triptych as the analysis framework for her study of CLIL teacher language awareness in university mathematics and computer science courses. Her findings suggested that lecturers' existing language awareness was implicit, but could potentially be strengthened through training designed around the Triptych and Cummins' (1984) concepts of BICS (basic interpersonal communicative skills) and CALP (cognitive academic language proficiency). Banegas et al.'s (forthcoming) work with student language teachers confirmed the Triptych's value as a planning tool, and also showed how it helped to expand their perspective on language as a vehicle for meaning-making in the classroom rather than simply the object of learning. It should be underlined that how teachers employ the Triptych to support learners' academic language development also depends on the cognitive demands that are embedded in the tasks provided to learners, and the language they need to negotiate such cognitive functions.

Cognitive discourse functions

Dalton-Puffer's (2013, Dalton-Puffer et al. 2018) taxonomy of CDFs in CLIL aims at 'a genuinely non-binary pedagogy for content and language integration' (Dalton-Puffer and Bauer-Marschallinger 2019, 30) by highlighting the role of language as an observable manifestation of subject-related cognitive processes. Table 1 provides an overview of the seven CDF types, in alphabetical order.

Dalton-Puffer's CDFs provide a heuristic for analysing, understanding and guiding languaging, i.e. using language to express and process meaning (Swain 2006), in content classrooms by 'bundl [ing]' (Dalton-Puffer and Bauer-Marschallinger 2019, 35) communicative actions into seven types. These types, denoted by performative verbs and examples of related 'member' verbs, might be applied and interpreted in different ways in different contexts or disciplines (Dalton-Puffer et al. 2018). It has been argued that CDFs should be integrated into classroom practice in order to embed the inextricable link between language and content in deeper disciplinary learning (e.g. Coyle et al. 2018; Coyle and Meyer 2021; Morton 2022), and to make the role of language explicit in integrated learning objectives, task instructions and feedback (Morton 2020). That said, in this study CFDs have played a rather peripheral role as an analytical taxonomy.

Recent studies have focused on detailed examination of individual CDFs such as CLASSIFY/CATEGORISE (Evnitskaya and Dalton-Puffer 2023) or DEFINE (Morton 2020; Nashaat-Sobhy and Llinares 2023). Studies have suggested that CDFs use can be affected by subject area (Dalton-Puffer et al. 2018; Evnitskaya and Dalton-Puffer 2023; van Kampen et al. 2021), topic (Dalton-Puffer et al. 2018; Nashaat-Sobhy and Llinares 2023; Salvador-Garcia and Chiva-Bartoll 2022), task type (van Kampen et al. 2021), teacher (Dalton-Puffer et al. 2018), and educational level (Nashaat-Sobhy and Llinares 2023). Interestingly, van Kampen et al. (2021) identify a distinction between the CDFs prevalent in the skills-based school subject Global Perspectives and those evident in earlier explorations of more 'traditional' subjects such as history and science. In particular, they observed

Table 1. Overview of CDFs and example member verbs, based on Dalton-Puffer (2013), with revision of CDF CATEGORISE in line with Dalton-Puffer and Bauer-Marschallinger (2019) and Evnitskaya and Dalton-Puffer (2023).

Type	Members (examples)
CATEGORISE	classify, compare, contrast, match, structure, categorise, subsume
DEFINE	define, identify, characterise
DESCRIBE	describe, label, identify, name, specify
EVALUATE	evaluate, judge, argue, justify, take a stance, critique, recommend, comment, reflect, appreciate
EXPLAIN	explain, reason, express, cause/effect, draw conclusions, deduce
EXPLORE	explore, hypothesise, speculate, predict, guess, estimate, stimulate, take other perspectives
REPORT	report, inform, recount, narrate, present, summarise, relate

a high number of incidences in both teacher and learner in discourse of the CDF EVALUATE in Global Perspectives. In addition, those authors observed instances of metadiscourse, in which teachers paid explicit attention to CDFs as part of the learning process.

In relation to CDFs as a tool for supporting learning or teacher professional development, Morton (2022) observed that the presentation of CDFs as an integrated approach helped teachers to reconceptualise their understanding of the relationship between content and language. In a study based on analysis of assessment tasks and learners' essays, Wu and Lin (2022) advance what they call 'an integrative model for CLIL' to analyse the linguistic and cognitive demands of a task and support student performance. The model includes four layers: (1) thematic patterns, which are integrated with (2) CDFs, which in turn respond to (3) genres and registers, and these are embedded in (4) curriculum context. According to Lemke (1990), thematic patterns are 'the patterns of connections among the meanings of words in a particular field' (12). Such connections include semantic relations between thematic units contained in a thematic pattern. For our study, the connections between thematic patterns and CDFs are important because they show the language demands associated not only with disciplines but also with (meta)cognitive processes and learners' knowledge construction.

The study

Two research questions guided the current study: (1) How do secondary school teachers use the Language Triptych to scaffold language learning in CLIL?, and (2) Can the Language Triptych support learners' language development and CDFs in CLIL?

The findings reported here are part of a CAR (Burns, Edwards, and Ellis 2022) project initiated by a group of teachers and supported by Author 1. The project took place at a bilingual secondary school in Argentina in April-October 2022.

The project: context and genesis

In September 2021, three secondary school teachers working at a private Spanish-English bilingual school in Argentina approached Author 1 as they wished to enhance their CLIL practices in relation to supporting the learners' development of English in the context of formal education, i.e. academic L2 literacy. They were teachers of Biology, History and Literature, respectively, which are compulsory subjects in the first three years of Argentina's six-year secondary education. The school's bilingual education curriculum involves two or three subjects per year being delivered in English, while the rest are delivered in Spanish, the dominant language in Argentina. The three teachers and Author 1 agreed that they would concentrate on two Year 3 classes since the three teachers shared them. Biology and History were each delivered through one two-hour lesson per week. Literature was delivered through one 80-minute and one two-hour lesson per week.

Given the teachers' aim and reported needs, a two-pronged approach was agreed (Table 2), with the objective of enhancing the teachers' understanding and practices. Track 1 supported the teachers in their understanding and use of CLIL features and the Language Triptych as an organising pedagogical tool. Track 2 entailed teachers carrying out their own action research projects in two cycles. It should be noted that the activities carried out by Author 1 in Track 1 between May and September 2022 brought both tracks together to enhance the collaborative nature of CAR. In turn, Author 2 collaborated with Author 1 in understanding the overall experience and analysing the data sets.

Participants

Table 3 provides details of the participating teachers' background. Participants are referred to by pseudonyms. The L2 proficiency levels are the participants' self-reported scores, based on exams administered by their employer.

Table 2. Project organisation.

TRACK 1 (Author 1-led)	TRACK 2 (Teacher-led)	TEMPORALITY
2 online workshops led by Author 1 on CLIL features, lesson planning, and the Language Triptych (focus on language awareness activities for the teachers and how to use them with their students).		April 2022
1 online workshop on CLIL lesson planning and action research.		May 2022
1 online workshop on planning an action research-based project.		May 2022
One-to-one online tutorials every other week to discuss the teachers' action research.	Each teacher implements Cycle 1 of their action research for four weeks.	June-July 2022
1 online meeting to discuss lessons learnt and prepare for Cycle 2 of action research.		July 2022
One-to-one online tutorials every other week.	Each teacher implements Cycle 2 of their action research for six weeks based on the evaluation of Cycle 1.	August-September 2022
1 online meeting to discuss lessons learnt from the action research experience.		October 2022

The participating learners belonged to two classes: 3A (18 learners) and 3B (20 learners). Their average age was 14.6 and their level of English language proficiency ranged from B1 to B2. Between Cycle 1 and Cycle 2, all of the learners sat and passed the Cambridge English First Certificate for Schools International Exam (B2).

Data collection and analysis

This study draws on different data sources emanating from the tracks described in Table 2. In all cases, data were collected in the context of professional learning (Track 1), or teaching and learning (Track 2). Data collection ensued only after having obtained written consent from the participating teachers and their learners. Within both tracks, the participants were ensured respect, dignity, confidentiality, and anonymity. All learners involved granted written consent. The participating teachers in their identity as teacher-researchers also engaged in micro-ethical practices (De Costa et al. 2020) to design preventative procedures pertaining to coercion, power relationships, and trust in their relationships among themselves and with their learners, whose primary interest was in learning rather than being part of a study/professional development initiative.

The data collection instruments were:

- One-to-one online tutorials: These were audio recorded with the aim of capturing the teachers' reporting, reflections on practice, and perceptions. There were 24 tutorials (mean length: 38 min) in total (eight with each teacher).
- Online meetings: These were group meetings that provided a space for the teachers to share their progress, raise concerns, and feed forward. In total, there were two meetings, involving all three teachers and Author 1 in the role of facilitator (mean length: 52 min).

Table 3. Participating teachers' details.

Teacher	Subject	Educational background	Years' teaching experience	English L2 proficiency (CEFR)
Antonia	Biology	BEd (with Qualified Teacher Status, QTS) in Biology	8	B2
Beatriz	Literature	BEd with QTS in English Language Diploma in English Linguistics	13	C2
Camilo	History	BEd with QTS in History Diploma in Latin American History	11	B2

- Classroom recordings: The participating teachers used their mobile phones to audio-record their lessons. Each teacher recorded 6–8 lessons in Cycle 1 and 6–10 lessons in Cycle 2.
- Teaching materials and notes: The teachers maintained a digital record of lesson plans, worksheets, slides, or any materials that supported teaching and learning, including photos of whatever they wrote on the whiteboard.
- Learners' coursework: The teachers maintained a record of learners' written/multimodal (e.g. video presentation) coursework which illustrated their language use in relation to the Language Triptych. This included photos of learners' work.

Data obtained from the online tutorials and meetings as well as the classroom recordings were selectively orthographically transcribed, i.e. teachers only transcribed learning events which illustrated the students' language use in relation to the Language Triptych, and the researcher transcribed events in meetings which illustrated the teachers' understanding of those learning events.

The datasets were subjected to qualitative content analysis (Selvi 2020). This was an iterative process which involved reading and re-reading the data before linking them to pre-conceived codes such as 'language of learning' from the Language Triptych (Coyle et al. 2010), or 'EVALUATE' from CDFs (Dalton-Puffer 2016; Evnitskaya and Dalton-Puffer 2023), and emerging codes (e.g. metalearning language) which were identified through open coding. Hence, coding reconciled deductive and inductive processes to provide a holistic picture of the action research carried out by the teachers. Through axial coding, the initial codes were first arranged into broader categories (e.g. language about learning). For the purpose of ensuring confirmability, trustworthiness, and transparency (Lincoln and Guba 1985), a colleague not familiar with the study acted as an inter-rater of 50% of each dataset. Discrepancies were discussed until agreement was reached.

Findings and discussion

This section adopts a temporal structure to highlight the motives and intentions between the two AR cycles and their pedagogical outcomes. Despite this time-orientated organisation, both research questions direct data interpretation. As the data analysis did not yield differences according to teacher/class, the data excerpts should be considered exemplars of teaching/learning across the three school subjects and the two classes (3A and 3B) involved.

Cycle 1: supporting language development

As mentioned above, the first cycle of action research was prompted by the teachers' aim of scaffolding language learning through the utilisation of a pedagogical tool. To this effect, the Language Triptych became a lesson organiser. This section illustrates each element of the Triptych in use.

Language of learning

With the aim of scaffolding general as well as disciplinary academic language (e.g. subject-specific terms) contained in thematic patterns, the three teachers exhibited a tendency to develop: (1) English/Spanish wordlists, (2) dictionary entries placed at the bottom of worksheets or in a shared online space, and (3) a wide range of activities which promoted awareness of disciplinary terms and syntactic structures, for example gap-filling, identifying textual reference, labelling diagrams and figures, multiple-choice, identifying key/recurrent words and cognates, and languaging (Swain 2006) concepts. The latter refers to learners' ability to articulate understanding of a concept and engage in knowledge construction by using their own words together with terms which they identify as central to meaning-making (see also Coyle and Meyer 2021). These resources and activities would either precede, accompany, or follow input, which was shaped in the form of teacher-led direct explanation/lecture, videos, or written articles.

For example, in one Biology lesson about the structure of animal cells, Antonia provided the learners with a gap-filling exercise. Figure 2 shows how a learner completed the activity (words in italics). The gap-filling exercise encouraged learners to use thematic items (e.g. *organelles*) which were part of semantic relations (e.g. *released* for transitivity/process) to complete thematic patterns associated to the CDF of DEFINING.

Drawing on a battery of similar glossary-like gap-filling activities, the learners had to work in pairs, where they would take turns to language the definition of a concept or provide the thematic item being defined. For example, data from Antonia's action research indicate that learners engaged in meaning negotiation (Llinares 2023), as illustrated in this exchange between two learners:

A: This word refers to … these are little organs that eh … contains … contain *enzimas* [Spanish for *enzymes*] … and … respiration esteh, como se dice libera? [How do you say release?]
B: Release?
A: eso [exactly], respiration release the energy contained in the organelle, eso, eso [this, this], organelle! (Excerpt 1)

These learners, supported by their L1, exhibited awareness and use of thematic patterns to define 'organelle', and the ability for self-correction (little organs/organelle).

The teacher also provided phrases such as 'refers to', 'involves', or 'is the part/process that … ' that would help them construct semantic relationships required for a definition. In terms of CDFs (Evnitskaya and Dalton-Puffer 2023), the activity supported the development of DEFINING as a core process in circumscribing and characterising knowledge within the area under study.

Language for learning

This element of the Triptych includes language learners' need to interact and negotiate meanings so as to complete lesson tasks. LfL prompted the teachers to engage in the design of language awareness activities as well as the provision of general syntactic structures and academic vocabulary, and where relevant, support with pronunciation, to enable the learners to complete the tasks successfully. For example, in a Literature lesson about science fiction in short stories, the learners were

	Function
Cytoplasm	A jelly-like material that contains (a) _*dissolved*_ nutrients and salts and structures called organelles. It is where many of the chemical reactions happen.
(b) _*Nucleus*_	Contains genetic material, including DNA, which controls the cell's activities.
Cell membrane	Its structure is (c) _*permeable*__ _*to*__ some substances but not to others. It therefore controls the movement of substances (d) _*within and outside* (in and out of)_ of the cell.
Mitochondria	(e) _*Organelles*_ that contain the enzymes for respiration, and where most energy is (f) _*released* in respiration.
(g) *Ribosome*_	Microscopic structures where protein synthesis occurs.

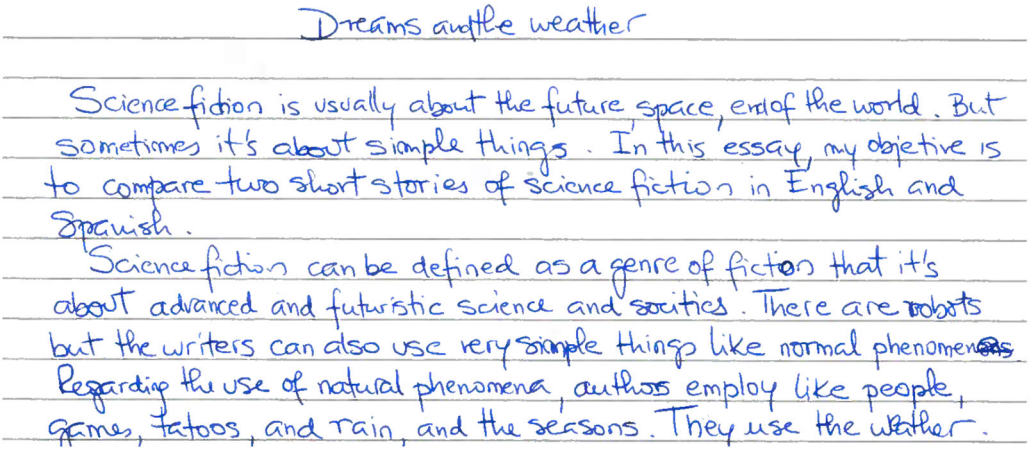
Figure 2. Activity promoting the language of learning.

Title	Dreams and the weather in science fiction
Introduction	Science fiction is usually... In this essay, my aim is to.../The purpose of this essay is to...
Key ideas	Science fiction can be defined as... Its main features are... Regarding the use of natural phenomena, in science fiction, authors employ...
The stories	In this paragraph, I provide a synopsis of both short stories under analysis. In The Last Night of the World by...., In La Nevada, Souto tells the story of...
Analysis I	In terms of commonalities, both stories show that...
Analysis II	However, the stories also have some differences. For example, in La Nevada, the author..... Whereas, Bradbury .....
Conclusion	Overall, the short stories show that... I think... Finally, I would like to...

Figure 3. Guiding template for essay writing.

asked to write a brief piece comparing Ray Bradbury's *The last night of the world* (original version in English) and Marcial Souto's *La nevada* [The snowfall] (original version in Spanish) in terms of building science fiction on the basis of a regular phenomenon (dreaming/snowing). For this activity, which supported the development of the CDFs CATEGORISING (comparing) and EXPLAINING (Evnitskaya and Dalton-Puffer 2023), Beatriz provided a template for textual organisation which included phrases to support students' use of semantic relations contributing to thematic patterns. She also provided a list of key words and synonyms (e.g. aim-objective, concerning-regarding-in relation to). Based on a template (Figure 3), Figure 4 illustrates an extract from a learner's essay based on the template.

Figure 4 exhibits the learner's ability to use thematic items which evidence LoL (e.g. the word 'genre') as well as semantic relations that constitute LfL (e.g. 'my obje[c]tive is to compare, can be defined as') to complete the writing task. It should be noted that the student used 'objective' (as provided by the teacher in a list mentioned above) instead of 'aim,' but still followed the prompt provided in the template, which sought to help learners organise their essay. Also, some suggested phrases were shortened, such as 'regarding the use of natural phenomena … '. These instances


Dreams and the weather

Science fiction is usually about the future, space, end of the world. But sometimes it's about simple things. In this essay, my objetive is to compare two short stories of science fiction in English and Spanish.

Science fiction can be defined as a genre of fiction that it's about advanced and futuristic science and socities. There are robots but the writers can also use very simple things like normal phenomenas. Regarding the use of natural phenomena, authors employ like people, games, tatoos, and rain, and the seasons. They use the weather.

Figure 4. Extract from a learner's essay.

suggest that LfL-oriented support not only allowed the learners to complete the tasks but also enabled them to express themselves through a wider range of thematic patterns. These are examples of LfL because this is general academic language used to complete a written task.

Language through learning

The teachers found this element of the Triptych elusive and challenging to address since it cannot be planned, and entailed being alert to learners' needs in situ and generating learning opportunities. Nevertheless, during the online tutorials and meetings, they agreed that they would implement what they called *How do you say* moments at the end of every lesson. For in-class activities, each teacher would walk around the classroom and provide linguistic support (or direct the learners to find the answer online) when requested. They would take note of all these requests. For submitted writing tasks, they would provide direct feedback (e.g. offering a suitable word/phrase/sentence) when there were signs of learners using Spanish or unclear English as a result of lack of language to articulate meaning. At the end of a lesson, they would devote the last five minutes to reviewing the support they had provided so that all the learners would profit from the language emerging as part of the process of learning. Figure 5 depicts what Camilo collated in a History lesson about oligarchy and power in the Viceroyalty of the Río de la Plata. He shared the list with all the learners at the end of the lesson and provided or elicited examples from them.

As recorded in Figure 5, LtL exhibits learners' linguistic needs for different thematic items and patterns which are the result of engagement with different CDFs for knowledge construction beyond the input provided. For example, in the same lesson, a learner asked Camilo:

S: Teacher, como digo que los registreros, bah los oligarcas llegaron a tener poder por sus lazos comerciales pero más se beneficiaban de la ilegalidad, del contrabando. Algo que las grandes empresas hoy siguen haciendo, evitar pagar impuestos [how do I say that the registreros, the oligarchs held power because of their commercial ties but they benefited from illegality, smuggling. Something that big companies still do, avoid paying taxes]. O sea [I mean], the registreros did legal and illegal business with Spain, but they didn't want to pay taxes, they … got richer, pero como conecto con el hoy? [but how do I connect it to the present?]

C: Perhaps you can say something like 'which is what companies, some run by those same families, still do today'? Run by como que todavía pertenecen a esas familias, sus descendientes [like the companies still belong to those families, their descendents].

(Excerpt 2)

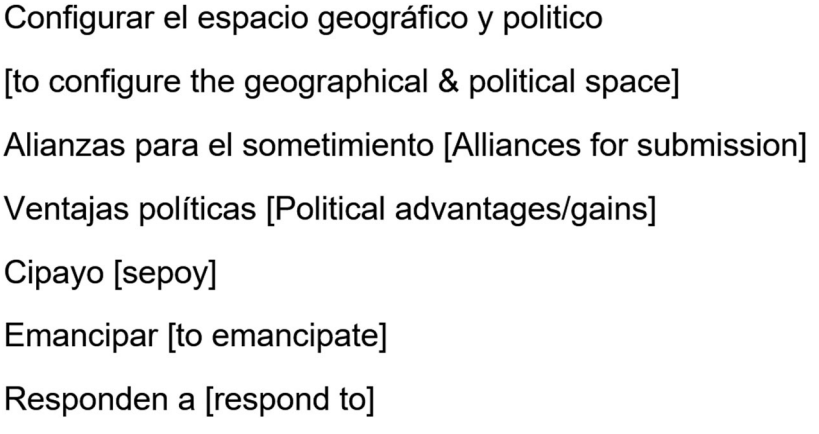


Figure 5. List of new language demanded by learners.

Excerpt 2 depicts the learner's attempt at EXPLAINING that the big fortunes of Argentina seem to be based on engaging in illegal activity. This conclusion led the student to need linguistic support to use thematic patterns that would enable him to express cognitive association between past and current economic practices.

Cycle 1: evaluation

Regarding teachers' development, as in previous studies (Banegas et al. forthcoming), the three teachers agreed that through the Language Triptych they offered systematic language scaffolding to enhance students' content and language learning. Beatriz and Camilo also recognised that they benefited from using the Triptych in their identity as L2 users of English and non-language specialists since it encouraged their awareness of disciplinary literacies (Coyle and Meyer 2021; Llinares, Morton, and Whittaker 2012). For example, Camilo said:

> I started paying myself attention to key words, repeated words, connectors, etc., and it's amazing how one can take these things for granted even in Spanish. History does have its own language, its particular way of communicating knowledge. (Excerpt 3)

Excerpt 3 thus shows that the teachers engaging in language awareness (Andrews and Lin 2018) activities for their own understanding of disciplinary literacies and for supporting their students acted as a professional development opportunity. In this regard, the experience encouraged the teachers to consider the role of literacies in their own subjects and across their linguistic (Spanish-English) repertoire.

Boosted by the improvements documented, the three teachers agreed to finish each lesson with a reflection moment after the *How do you say* moment. The aim of this last stage of the lesson would be for the students to express their experiences with knowledge construction and how they had felt during class. They thought that this moment could be carried out in Spanish as it would demand that the students articulated their thoughts on their own learning.

Regarding students' development, the three teachers noticed that the students showed 'more academic' (Beatriz) understanding as they utilised disciplinary and general academic language. They also noted another change among the students towards the end of Cycle 1 prompted by the *How do you say* moment. As put by Antonia:

> I think we noted it individually in our own lessons, and then we discussed it during the breaks, but it seems like they [the students] want to reflect on their own learning in English too. (Antonia, Excerpt 4)

Beatriz highlighted this change in learners' use of English and needs with an extract from one of such reflections on learning moments:

> S: Teacher, quiero decir que para poder entender el poema, me puse a comparar y armar una tabla y unos dibujos, y eso fue útil [I want to say that in order to understand the poem, I made some comparisons and put together a table and some drawings, and that was useful], but I want to say it in English. O sea [I mean], I want to say in English what I think I eh … I hice para [I did to] … I studied and learnt. (Excerpt 5)

Excerpts 4 and 5 demonstrate that as the learners started to become confident in the use of academic English of/for/through learning, the reflection moment incorporated by the teachers in their lessons prompted learners to develop the need to use English not only to evaluate disciplinary content/knowledge, but also to describe the metacognitive strategies they would deploy to construct such knowledge. This linguistic demand also signals a new dimension of EVALUATE ('and that was useful') and DESCRIBE ('put together a table … ') as CDFs. This demand became the aim of the second cycle of action research.

Cycle 2: extending language and cognitive development

The teachers' practices around activities supporting the language of/for/through learning did not differ from those experienced in Cycle 1. However, the teachers documented a steady

increase in the learners' academic performance exhibited, for example, through the following behaviours:

- In group presentations, slides were less text-based; therefore, learners relied less on simply reading from the slides, and used keywords/phrases/visuals to support their articulation of meanings.
- In written coursework (e.g. reports, essays), learners depended less on templates or samples, or they were confident to effectively change the templates or use a wide range of disciplinary and general academic language.

As teachers observed this growth in learners' performance, they concentrated on scaffolding the learners' engagement in metacognitive reflection in English. They collectively designed a series of activities to support linguistic and cognitive development. For example, they provided learners with a list of verbs (mental processes) which included: *relate, realise, become aware of, reconcile, apply, familiarise, put into perspective, situate, bring together, deconstruct, go over, go back*. They also created subject-specific surveys (Figure 6) to raise learners' awareness of learning strategies in tandem with language appropriate for metacognition. The teachers used these surveys to wrap up a topic. This support would enable learners to articulate semantic relationships connected to EVALUATING their own learning.

The teachers also asked the learners to (1) individually think and note down their learning strategies in Spanish/English, (2) arrange them in order of personal importance, and (3) compare their list with a peer using structures such as 'Finding more information about the author allowed me to … (gerund clause + allowed me to + …)' or 'With the help of (gerund clause/noun phrase), I was able to … '. For example, Antonia provided the following extract as evidence:

S1:	Yes, teacher, watching videos in YouTube with sub … subtitles in English allows … allowed me to see cell reproduction in movement
Antonia:	Do you mean in motion?
S1:	Claro [yes], in motion … and learn … este … especi … specific words, specific words.
Antonia:	Lovely! For example?
S1:	Yes, for example, coil, centromere and the queen of words: homologous (other students laugh).
S2:	Well, in my case I used a video to make screenshots and then I wrote my notes, a summary, my notes, algo asi [something like that] next to the screenshots. I found that strategy very helpful.

(Excerpt 6)

The excerpt shows that the learners were able to identify and verbalise their strategies together with disciplinary terminology, i.e. thematic units, when engaged in DESCRIBING and EVALUATING their own learning.

Cycle 2: evaluation

Regarding teachers' development, the three teachers evaluated the experience as a rich space to hone their teaching skills and professional knowledge around CLIL. In addition, they acknowledged that the implementation of the Language Triptych and the learners' demands at the end of Cycle 1 allowed them to be critical and creative beyond the Triptych. In this regard, Beatriz said:

> We teachers are so used to doing CPD [continuing professional development] courses that are about implementing this or that, following the expert's advice sometimes with little space to manoeuvre and do our own thing. But with this experience, we had the chance to use the Language Triptych and go beyond that by asking the students to use English to reflect on their own learning processes. Isn't that amazing? (Excerpt 7)

As previously reported in the literature (Banegas et al., forthcoming), the situated use of the Language Triptych became a professional knowledge expander as the teachers felt comfortable to extend the tool's remit to metacognitive discourse functions, i.e. communicative actions that enable

To what extent do you agree with these statements?

	I completely agree.	I partially agree.	I partially disagree.	I disagree.
To reconcile historians' views on the Port of Buenos Aires, I used a table to record commonalities and differences.	○	○	○	○
I situated contemporary tensions between Buenos Aires and the provinces by creating a timeline, adding causes and consequences.	○	○	○	○
First, I wanted to understand the conflict of the Port of Buenos Aires and other issues before I could deconstruct the whole situation.	○	○	○	○
I took notes to memorise some facts before I could create a concept map that would show my critical understanding of tensions between Buenos Aires and the Provinces.	○	○	○	○

Figure 6. Survey on learning strategies.

learners to DESCRIBE and/or EVALUATE their own learning processes regardless of school subject by incorporating the language *about* learning.

In relation to students' development, the teachers agreed that most of the learners seemed to be more motivated in class, which resulted in higher levels of participation. On this aspect Camilo noted:

> The learners are more interested, or at least they volunteer to speak more, and you can tell that they really make an effort to reflect on their learning in English. I can see them using notes, or an online dictionary to organise what they want to say. One of the students told me that she was happy she could use English to say more than historical facts. (Excerpt 8)

Excerpt 8 seems to confirm that some learners managed to fulfil their desire to express their metacognitive thinking in English. Thus, the learners found in the experience an opportunity to expand their ability to use English to refer to their own learning.

Discussion

The Language Quadriptych

As illustrated above, the three participating teachers employed the Language Triptych as a pedagogical tool to plan their lessons and design enabling activities that would help the learners develop awareness of and use disciplinary and general academic English. Through the use of the Triptych, the teachers also expanded their own language awareness. Thus, CLIL professional development based on the Triptych not only enhanced their practices, in line with findings from Kao (2022) and Turner and Fielding (2021), but also became a conduit to deepen the teachers' understanding of language learning and use, as previously reported by Banegas et al. (forthcoming). Regarding the learners' language development and CDFs in CLIL, the findings confirm that as the teachers provided further linguistic support, which emanated from using the Language Triptych as a planning tool (Coyle et al. 2010), the learners became more motivated and confident with articulating different CDFs to language and create disciplinary knowledge (Morton 2020).

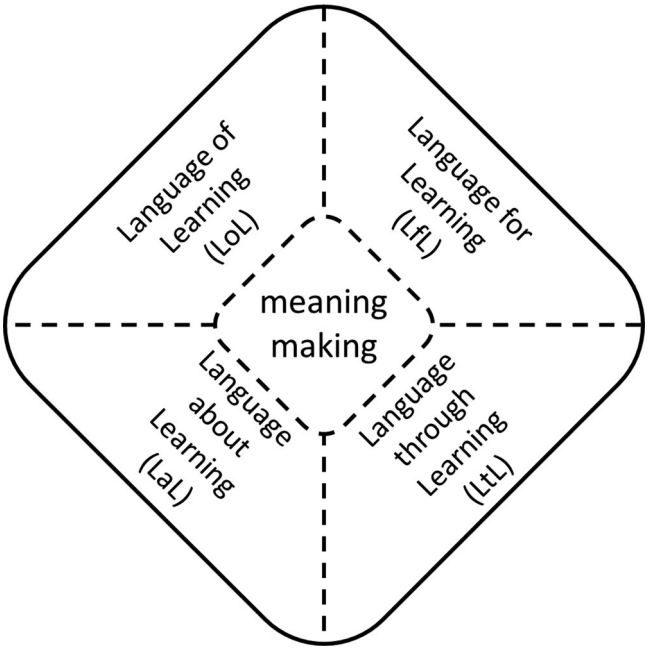


Figure 7. The Language Quadriptych.

So far, the experience underscores the necessity of reconciling language development with subject-related cognitive processes (Dalton-Puffer and Bauer-Marschallinger 2019). However, offering systematic support on language learning for teachers, which then translated into support for learners, led the teachers to identify and address the learners' demand for language *about* learning. Thus, the Language Triptych expanded the horizons of language use in a CLIL environment, and the teachers responded to this by embedding in the lessons time and activities which would nurture this new type of language. Drawing on this experience, we propose expanding the Language Triptych into the Language Quadriptych (Figure 7) to include the Language *about* Learning (LaL) that can facilitate learners in discussing and reflecting on their own learning. This type of language could be treated as general academic language, as learners may refer to learning strategies which can be utilised across the curriculum (e.g. combining screenshots and note taking as reported in Excerpt 6).

As mentioned above, through LaL, learners may manifest a new layer of CDFs (Dalton-Puffer 2013; Morton 2020) as they can use CDFs such as DESCRIBE and EVALUATE not only in relation to the disciplinary content but also in connection to explicit languaging (Swain 2006) of metacognitive processes. We should acknowledge that while CDFs per se are indifferent to what is being described/evaluated, they have until now only been examined and illustrated (e.g. Dalton-Puffer and Bauer-Marschallinger 2019) with subject 'content' in mind. This new layer has implications for both teachers and learners, as becoming aware of cognitive processes could enable them to engage in professional development as well as teaching and assessment practices orientated towards such CDFs as suggested in the literature (e.g. deBoer, Leontev, and Friederich 2023; van Kampen et al. 2021).

It should be emphasised that this revised planning tool for CLIL is the outcome of learners' self-directed needs as they noticed that their academic language use and learning improved as a result of systematic language learning support provided by the teachers. Hence, the Language Quadriptych can be conceived as a learner- and learning-centred tool for enhancing CLIL provision.

Conclusion

The use of Coyle's (2007) Language Triptych, coupled with the participating learners' demands and their teachers' ability to notice and respond to them, has allowed us to extend it into a Language Quadriptych, incorporating the use of language about learning and related CDFs required in order for learners to discuss metacognitive strategies. Notwithstanding, this experience may not be replicable since the project was teacher-initiated, supported by the participating teachers' schools, and facilitated by Author 1 without any financial support. We acknowledge that the environmental advantages behind this study may be obstacles in other settings. We also recognise that the absence of interviews with the teachers or learners may have limited our understanding of the experience.

In terms of practical implications, this CAR-based study may encourage teachers and teacher educators working in CLIL environments to adopt and adapt the Language Quadriptych as a potent pedagogical tool for lesson planning and activity design. As has been shown here, this tool could also be a means to harness the insights gained through research into CDFs and give them a practical application. While CDFs are a construct that has thus far mainly been discussed in theoretical terms, the Language Triptych has been largely a practical tool. The discussion here of CDFs in relation to the Quadriptych could be a first step in the direction of bridging the gap between theory and practice.

This study could also inspire researchers to gauge the extent to which LaL may interact with the other elements of the Quadriptych and impact on deeper learning (Coyle and Meyer 2021), and to explore manifestations of all four elements in terms of CDFs. Furthermore, the success of this study in both practical and theoretical terms could serve to inspire CLIL practitioners to engage in action research in order to further strengthen their practice. Such projects could move beyond this one by taking a more participatory approach, in which learners are actively and meaningfully involved in

designing and carrying out the research (Smit et al. 2020). The significant role played by learner input in the current study, signalling the need for attention to LaL, could be viewed as a reminder of the value of learners' voices in enriching education.

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