

The C of Cognition in CLIL Teacher Education: Some Insights from Classroom-Based Research

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Abstract This chapter aims at describing real foreign language (FL) teaching practices in state bilingual schools in the Region of Madrid (Spain) through the lens of the teachers involved in Content and Language Integrated Language (CLIL) settings. More specifically, our objective is to map the variety of pedagogical tasks proposed in the CLIL classroom to promote critical thinking skills around the comprehension of a given content. The source of these data is 71 experienced FL primary teachers working in the Madrid bilingual programme. The area of Madrid is considered here as an illustrative example of other monolingual regions of Spain, where some primary school subjects such Natural and Social Sciences, Arts & Crafts and Physical Education have been taught in English for more than 10 years now. Findings highlight that the most frequent CLIL reported practices in primary are designed to review and activate prior knowledge before the comprehension process of a given text, followed by a series of tasks aimed at working on low order thinking skills mainly. These results partially confirm certain dissension with the academia about the real implementation of CLIL in the primary classroom and suggest the need for a thorough discussion about good practices and routines in CLIL and their application in ESP teacher training.

Keywords Cognition · CLIL · Primary FL teachers · Thinking skills · Critical thinking skills · Teacher training

1 Introduction

There is a plethora of studies focused on the benefits of Content and Language Integrated Learning (CLIL) in primary education (e.g. Jiménez Catalán et al. 2006; Lasagabaster 2000; Hüttner and Rieder-Bünemann 2010) and in other teaching

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contexts (e.g. Admiraal et al. 2006; Loranc-Paszyk 2009; Whittaker et al. 2011). There is also a bulk of literature which describe CLIL effective practices (De Graaff et al. 2007; Halbach 2008; Leung 2015; Meyer 2011; Navés 2009). These include a balanced integration of content and language, inductive reasoning, scaffolding, cognitively challenging activities and thinking skills. However, our own observations and conversations in Madrid with in-service teachers, student trainees and language assistants unveil difficulties and discrepancies with the academia about the real implementation of CLIL education in the primary classroom. Topics such as the lack of specific work on intercultural competence, the unbalanced focus of language over content, the partial absence of proper materials, among others, have repeatedly arisen in our teacher training activities – particularly in peer-coaching sessions and interviews with our student teachers doing placements at bilingual schools.

Our aim in this chapter is to dig into one of these issues: the role of cognition, one of CLIL's four dimensions (4 Cs) (Coyle 2005; revisited Coyle et al. 2009). Learning new content through a foreign language (FL) often requires learners to find information by processing language and extracting meaning from spoken and written texts which are at a higher level than the learners' current productive capability. On the other hand, thinking skills lead to effective communication and improve problem-solving ability. Thus, by being taught specific thinking skills and the associated language, learners are better equipped to deal with the complex academic and cognitive demands of learning school subjects in a FL.

Unfortunately, there is a paucity of research on cognition in CLIL. Not many studies get down to the classroom to observe its development in the primary classroom in this respect, albeit with some exceptions. A close review of the scholarly work developed in the Spanish teaching context reveals that CLIL teaching practices and textbooks in primary are more dedicated to developing lower-order thinking skills (LOTS) than to higher-order thinking skills (HOTS) and critical thinking (Gerena and Ramírez 2010; Santo-Tomás 2011). Thus, we intend to offer an evidence-informed contribution to this ongoing debate by describing and analysing the most common teaching practices regarding thinking skills in primary as voiced by educators who are daily involved in CLIL settings. The ultimate objectives we pursue are: (1) to contribute to the convergence between FL research, the exercise of the primary teaching profession and CLIL teacher education; and (2) to propose possible ways to improve training for teaching in CLIL, as we contend that good teacher training is critical to CLIL's success (Coyle 2009; Hillyard 2011).

For this purpose, in this chapter we present findings mostly drawn from the analysis of 71 questionnaires of experienced FL teachers working in the bilingual programme of the Region of Madrid. These questionnaires belong to a wider corpus of 400 surveys designed, collected and analysed in four different European countries within the framework of the European project SBATEYL¹. SBATEYL is an Erasmus + K2 programme aimed at designing web and school-based reflective resources for FL teachers of young learners based on data from practising teachers in Turkey, Slovenia, Italy and Spain.

¹SBATEYL is an acronym for *Web and School-based Professional Development Project for Foreign Language Teachers of Young Learners* (2014-1-TR01-KA201-013197).

2 The Context of This Study

As English as a foreign language (EFL) teacher trainers at university, our main aim is to equip future primary teachers to master the FL and prepare them to thrive in diverse education settings. In the Region of Madrid, where we live and work, a large number of FL teachers in primary education carry out their professional activity within the framework of the so-called *Programa Bilingüe* (bilingual programme), which is based on CLIL education (VVAA 2016). As implemented in Madrid, this means that in addition to the EFL lessons – 4 or 5 sessions per week –, children get up to 5 sessions of other content subjects in English – with the exception of Mathematics and Spanish Language and Literature. In practice, they typically receive English instruction in Natural and Social Sciences and Arts & Crafts, and to a much lesser extent, in Physical Education (Fernández-Agüero 2010).

Madrid's bilingual programme began 12 years ago in 1st of primary in 26 primary state schools and has progressively been implemented in all the school years up to the end of compulsory secondary. Nowadays, this programme has 463 participant schools belonging to the state education regional network: 353 primary schools – 242 of which work completely in CLIL – and 110 high schools – 81 teach CLIL across compulsory secondary² (see Llinares and Dafouz 2010 for an overview of this programme).

Madrilean regional authorities generally entrust primary FL teaching to language specialists with at least CEFRL³ level B2 (the government aims at C1 by the year 2020) who, in the CLIL provisions, may also be asked to teach content subjects, provided they obtain a specific qualification, normally through a comprehensive exam that certifies their capacity to teach FLs independently of their previous training for teaching. In Madrid, primary student teachers complete a 4-year bachelors' degree (240 ECTS) to be able to obtain the required qualifications to work in any Spanish school (either private, public or state subsidised). The study programmes at the Spanish universities are focused on both theoretical contents and pedagogical practice. In the case of Autonomous University of Madrid (UAM), primary student teachers combine on-campus theoretical modules with different periods of teacher training at state schools. During the last year of their degree, some students obtain a certificate as EFL specialists following specific pre-service training (ESP language subjects such as 'English for education' and 'classroom English for teachers', FL teaching and children's literature) and a 16-week school practicum. It is very likely that these student teachers' professional career will be related to CLIL in one way or another.

²Data from academic year 2015–2016 (VVAA 2016).

³CEFRL stands for Common European Framework of References for Languages (Council of Europe 2001).

3 Content and Language Integrated Learning: Benefits and Drawbacks

In the 1990s, CLIL emerged as an umbrella term covering different learning forms in which a language has a special role in the process of learning disciplinary matter or content. Gradually, this acronym has been adopted by European researchers and institutions as a generic term for such forms of education, and CLIL programmes are now widely implemented in Europe (European Commission 2012). CLIL education, frequently defined as “a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language” (Coyle et al. 2010: 1), is an “increasingly acknowledged trend” in FL teaching (Pérez Cañado 2012: 319), put forward as a solution to Europe’s deficient language standards after the research on the age factor in second language acquisition seems to have come to the conclusion that ‘the earlier the better’ is not the case with mainstream FL instruction (García Mayo and García Lecumberri 2003; Muñoz 2006). Certainly, CLIL has gathered momentum, being perceived – whatever the age of CLIL onset – as the long-awaited answer to the need to train European citizens who are competent in several languages of plurilingual Europe, more specifically language users of at least three languages (Pavesi et al. 2001: 77). Likewise, the teaching of content through English in higher education in contexts where English is a FL – commonly known as English as a Medium of Instruction or EMI – has rapidly grown to attract prospective students by increasing internationalisation at home and providing an added value in terms of employability and career prospects (Dearden 2017, this volume; Staub 2017, this volume).

The popularity of CLIL is initially grounded on research into bilingual models such as the renowned French immersion programmes in Canada launched in the 1960s, which consistently and rigorously supported the advantages of bilingual instruction (Swain and Lapkin 1982 in Ontario; Genesee 1987, 1994 and Cloud et al. 2000 in Montreal; Krashen’s work such as Krashen and McField 2005; Lambert and Tucker 1972) and were related to maintaining or boosting the bilingual status of two languages in a given community. In these situations, it has been argued that bilingualism promotes creativity and cognitive flexibility, and has metalinguistic and intellectual benefits for the learner, who is forced to apply and develop more communication and problem-solving strategies (Cummins 2000). Bilingual children in immersion education experience language inhibition (Bialystock 2005), which means that they tend to engage in language tasks by forgetting language as a code. This involvement in the task makes them persist when difficulties arise and as a consequence, in this type of education there is in-depth language processing.

European CLIL, for its part, is typically associated with providing instruction in a FL – normally a socially-prestigious international lingua franca such as English – in a sort of educational, rather than social, bilingualism where “the focus changes from language as a vehicle of culture to language as a means of communication in academic settings” (Lorenzo 2007: 28). In this milieu, many scholars advocate for bilingual education too, as a realistic way to improve exposure and intensity to the

target language in an otherwise overloaded school curriculum (García Mayo 2003: 107). Surely, CLIL is supported by a solid research tradition (Dafouz and Guerrini 2009; Escobar Urmeneta and Nussbaum 2011; Lasagabaster and Ruiz de Zarobe 2010; Lorenzo et al. 2011; Navés and Muñoz 1999; to name just a few). Even though teaching content through a FL does not automatically convey an improvement in students' FL proficiency (Dearden 2017, this volume), recent research conducted in Europe claims that CLIL learners usually outperform non-CLIL ones in general proficiency (Admiraal et al. 2006; Jiménez Catalán et al. 2006; Loranc-Paszylk 2009; Ruiz de Zarobe 2010) and in the subject-matter they perform at least equally (Heine 2008; Jäppinen 2006).

Nowadays, CLIL tends to be presented as a cognitively desirable option (Cenoz 2003; Lasagabaster 2000; Muñoz 2007) and is usually discussed from a broader perspective encompassing principles of good pedagogy such as fostering critical thinking (Mehisto 2008). It is supposed to be an acquisition-rich environment, where content information processing strategies abound and students “are intellectually challenged to think critically about content and language in both content and language classes, look for relational links among subjects, and reflect upon the learning process” (Mehisto 2008: 96). CLIL learners report using a wider range of strategies than non-CLIL learners, with regards to the type and range of strategies favoured as well as the frequency of their use (Psaltou-Tzoysy et al. 2014). Specific thinking skills such as predicting, comparing, organising, problem-solving, etc. and the associated language seem to be better developed in CLIL provisions to deal with the complex academic and cognitive demands of learning school subjects in a FL. And these thinking skills “enable students to be independent learners [...] and might help to overcome socio-economic and cultural differences” (Chipman et al. 1985: 5).

While there is an important number of studies focused on the benefits of CLIL in primary education, the conceptualisation and pedagogical implementation of CLIL have of late started to be questioned (Bruton 2011, 2013; Cenoz et al. 2014; Harrop 2012; Pérez Cañado 2012). Typically seen as a “flexible operational framework for language instruction” (Dueñas 2004: 75), CLIL could likewise be deemed as too flexible, or overly inclusive, so that its boundaries are too hard to pin down (Alejo and Piquer 2010). This ties in with CLIL's potential problems for pedagogical coherence. Above all, CLIL is a grassroots initiative realised in an array of educational actions, and this heterogeneity seems to go against pedagogical uniqueness. In the words of Cenoz and her colleagues (Cenoz et al. 2014: 255), “the extent to which CLIL [...] entails a specific well-defined pedagogical approach to content and language integrated teaching [...] is presently not clear and, thus, open to question and discussion”. Apparently, some of CLIL's main features – its rapid spread and its bottom-up implementation – can somehow be working against CLIL itself: its expansion “has outpaced measures of its impact” (Pérez Cañado 2014: 316) and its teacher-led nature may have caused related theory lag behind.

Also, teachers put forward structural difficulties to implement CLIL (in Spain, see Bruton 2011; Cabezuelo and Fernández 2014; Fernández and Halbach 2011; Laorden and Peñafiel 2010). Pérez Cañado (2014), for instance, identifies a number

of areas that teachers are concerned about, namely linguistic and intercultural competence, the theoretical underpinnings of CLIL, materials and resources, student-centered methodologies, and ongoing professional development. Outside the target language community, certain questions come to the fore, for instance, in relation to language levels of proficiency of students and teachers; and the use of the FL in the school context as “the possession of a common [mother tongue], and a lower than optimal level of articulateness in the [second language], may conspire against use of the [second language] for learning” (O’Dwyer and Atlı 2017, this volume).

As to the development of thinking skills, Gerena and Ramírez (2010) report that CLIL lessons in Madrid do not enhance practices such as reviewing or activating prior knowledge before teaching the main lesson, using higher order thinking questions and activities. More specifically, these scholars explain that although vocabulary development was good, students had difficulties in expressing their thoughts and conceptual understandings fluently because they had few opportunities to predict, infer, compare or contrast. In their view, this was probably due to scarce higher order thinking questions and a teacher-centred pedagogy characterised by plenty of teacher talk and teaching by the book. This goes against claims such as Leung’s: “in a CLIL lesson, ideally, there should be a range of question types which involve thinking processes of various depths” (2015: 126).

In a similar vein, Santo-Tomás (2011) analysed Bloom’s revised taxonomy of thinking skills (BRT; Anderson and Krathwohl 2001) in four CLIL textbooks of Science frequently used in primary (grade 2) in the Region of Madrid. These thinking skills were placed on a continuum ranging from the highest to the lowest order skill: remembering is at one end and understanding on the other, the intermediate steps being creating, evaluating and analysing. According to this system, LOTS are developed through activities such as identifying, labelling, underlining concepts, etc., while HOTS call on the application, analysis and elaboration of the new content, by comparing and contrasting, justifying, prioritising, inferring, etc. Santo-Tomás’ results confirm that the most frequently activated thinking skills in the context of CLIL correspond, again, to lower order thinking categories.

In sum, there appears to be dissonances between the potentialities of CLIL described by the literature regarding Coyle’s (2005) C for Cognition and what really takes place in the primary classroom. Our objective in this chapter is to put forth data which somehow complement this debate.

4 Data and Methodology


More specifically, we aim at mapping the variety of pedagogical tasks proposed in the CLIL classroom to promote critical thinking skills in comprehension activities as explained by 71 experienced FL primary teachers working in Madrid’s bilingual programme. The data was collected as part of a larger study, where these educators were asked about different aspects of their daily teaching activity with the help of

an *ad hoc* designed questionnaire whose ultimate goal was to identify both good practices and areas of improvement. In the questionnaire, we used a 1–4 Likert scale – (1) Always; (2) Very often; (3) Sometimes; (4) Rarely – to inquire about methodology, the development of language activities – listening, speaking, reading and writing –, intercultural competence and the use of ICT, among other topics in FL teaching in primary. The authors of this chapter were responsible for the elaboration of the survey items regarding the types of tasks proposed to develop reading and listening, that is, language comprehension vs. production (items 18–42). That is why we will focus on these language skills here.

The instrument of analysis was furnished with the following characteristics (Fraenkel et al. 2014): validity (conducted on the basis of scientific literature), including a pilot study; reliability (exact instructions and clear, specific questions); and objectivity (97 closed-type questions). The Cronbach coefficient ($\alpha = 0.916$) confirmed the high reliability of the instrument. The data were gathered in May 2015 and analysed by use of descriptive statistics.

As for the procedure followed, we performed an inductive bottom up analysis of all the questions in the survey that inquired about the tasks devoted to the comprehension of a given content and classified these tasks depending on three different parameters: (1) the process applied to learn, according to Bloom's revised taxonomy (Anderson and Krathwohl 2001) (see Table 1); (2) the language activity (reading or listening) in which informants said that they applied that process; and (3) the phase of the comprehension process when it was applied, namely before, during or after the comprehension activity. In the next section data will be presented through percentages, which have their origin in the number of teachers who selected (1) Always and (2) Very often regarding a given task by language skill, vs. those who selected (3) Sometimes and (4) Rarely. For example, if 54 out of 71 teachers selected Likert scale options (1) and (2) to indicate the frequency by which they

Table 1 The cognitive process dimension

Thinking skills and associated tasks		
Higher-order thinking skills (HOTS)  Lower-order thinking skills (LOTS)	Creating	Making, designing, constructing, planning, producing, inventing
	Evaluating	Checking, hypothesising, experimenting, judging, testing, monitoring
	Analysing	Comparing, organising, outlining, finding, structuring, integrating
	Applying	Implementing, carrying out, using
	Understanding	Comparing, explaining, classifying, exemplifying, summarising
	Remembering	Recognising, listing, describing, identifying, retrieving, naming, finding, defining

Adapted from Anderson and Krathwohl (2001)

<http://www.onestopenglish.com/thinking-skills-for-clil/501197.article>. Last accessed Feb 4th 2017

propose their learners to brainstorm before listening, brainstorming is reported to be used as a frequent pre-listening task by 76% of the surveyed teachers.

5 Results

For the sake of clarity, findings are shown in three different blocks: most frequent comprehension pre-tasks, while-tasks and post-tasks in relation to thinking skills.

5.1 Most Frequent Comprehension Pre-tasks

Before the comprehension process, the teachers who participated in the survey stated that they implemented a series of tasks to activate prior knowledge about a given content. The most frequent tasks reported before reading or listening to a text were prediction, brainstorming and discussion. Brainstorming is a technique which encourages learners to produce ideas quickly without critical examination or evaluation, that is, LOTS. Prediction and discussion, however, stimulate HOTS since they serve to promote critical thinking through the analysis and the evaluation of a given content. Figure 1 portrays the results as regards these three types of tasks by language skills:

The percentages in Table 1 indicate that brainstorming and prediction were very frequent as pre-listening tasks, while discussion was slightly more common before reading a written text.

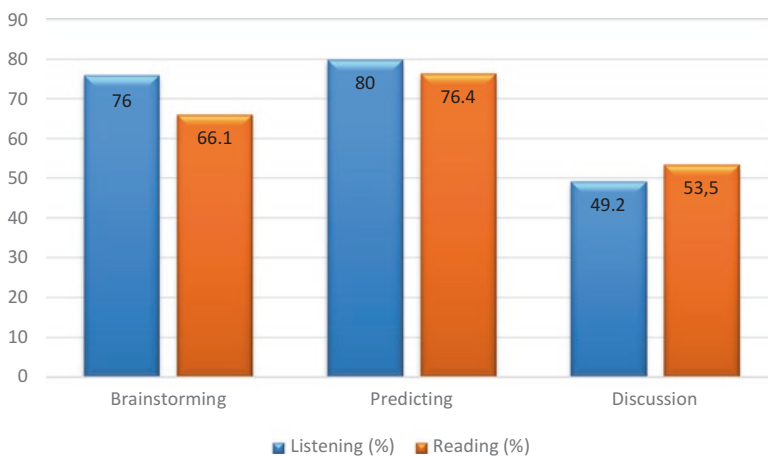


Fig. 1 Tasks put into practice by teachers before comprehension

Table 2 Tasks put into practice by teachers during the comprehension process

While-activities	HOTS or LOTS
General comprehension questions	LOTS
True/false	LOTS
Fill-in-the blank	LOTS
Multiple choice	LOTS
Give-the-right-order	LOTS
Information transfer	HOTS
Problem-solving	HOTS

5.2 Most Frequent Comprehension While-Tasks

Concerning the tasks that come up during the comprehension process of an oral or written text, the most frequent tasks put forward by the participants are shown in Table 2 from the most to the least frequent.

Respondents stated that general comprehension questions were the most frequent tasks when reading and listening, followed by true/false and fill-in-the-blank activities. All these tasks demand from learners to recall and understand the new information (LOTS). At the same time, they serve as the basis to develop some HOTS in the CLIL classroom, problem-solving and information transfer being the most frequently reported activities of this sort – but still less frequent than the LOTS.

By skills, we can see that general comprehension and give-the-right-order tasks are more often carried out as while-reading activities. On the other hand, true-false, fill-in-the-blank, multiple choice, problem solving and information transfer activities are more commonly developed as while-listening activities in the CLIL classroom, as depicted in Fig. 2.

5.3 Most Frequent Comprehension Post-tasks

Once students have understood the content, the teachers surveyed expressed that they applied a number of tasks that could help students develop their thinking skills. As Table 3 shows, the most frequent ones are role-plays and writing tasks followed by discussions and summaries. Role-plays and writing tasks help learners to fully understand the new information and to apply it in a pedagogical environment (LOTS). As for the development of HOTS, discussions seem to be a more frequent task at this stage of the comprehension process. The cognitive advantage of having discussions is that learners learn to dissect, appraise, compare, defend, evaluate, justify, prioritise and reformulate a given information. Yet, it is one of the few reported practices to develop HOTS in the CLIL primary classroom.

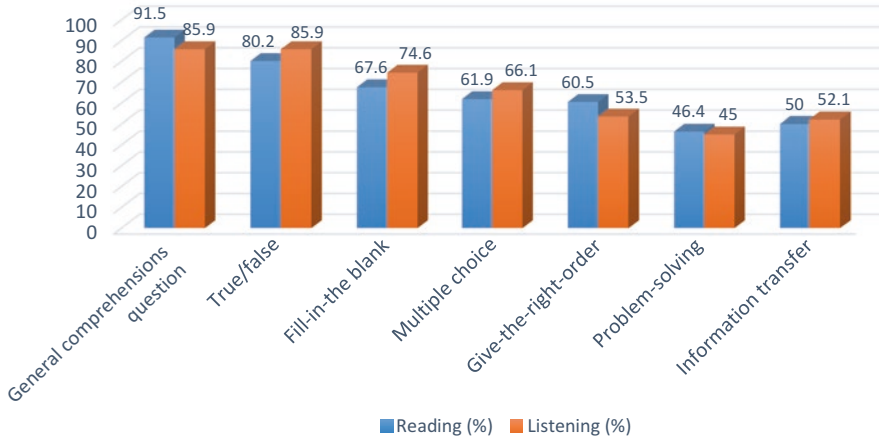
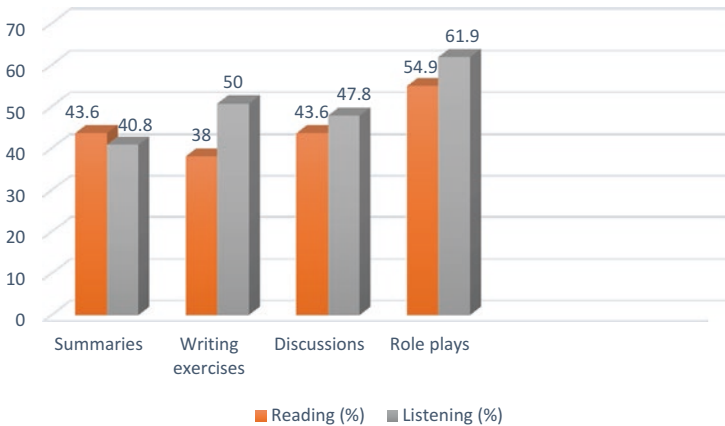


Fig. 2 Tasks put into practice by teachers during the comprehension process by skills

Table 3 Tasks put into practice by teachers after comprehension activities



6 Discussion and Implications for ESP Teacher Training

In the previous section we have presented the results of a small scale study focused on the most frequent teaching activities put into practice in the CLIL classroom to develop students’ thinking skills. Findings highlight that the 71 CLIL teachers reported practices designed to review or activate prior knowledge before the comprehension process of a given text, followed by a series of tasks mainly aimed at working on LOTS, which is partly coincident with previous research on this issue for the same context (Gerena and Ramírez 2010; Santo-Tomás 2011). Unfortunately, there is a small presence of reported tasks used to stimulate HOTS by these teachers working in the Madrilean CLIL primary classroom, namely prediction, discussion, some problem solving and information transfer. In particular, findings tell us that

activities which involve debates and discussions come up regularly to activate prior knowledge, and to help integration of language and content along the teaching process, to “move the learner on in terms of both content and language” (Harrop 2012: 59). Nevertheless, CLIL is traditionally claimed to be an educational proposal which sharpens “the focus on the interconnections between cognition and communication – between language development and thinking skills” (Coyle et al. 2009: 13), and we would expect this to be realised habitually in a variety of tasks and activities.

How to explain this discrepancy between our review of the literature on CLIL theory and the reported practices of the teachers in this study on the real implementation of CLIL in the primary classroom? It begs the question whether part of the academia may be assimilating the characteristics of CLIL to those of immersion programmes – as reported in Swain and Lapkin (1982), Lambert and Tucker (1972), etc. Indeed, CLIL has sometimes been equated to immersion, or even considered to embrace it (Lasagabaster and Sierra 2010), and there is evidence to support that bilingual schooling entails cognitive benefits such as divergent thinking, creativity, early metalinguistic awareness and communicative sensitivity (Baker 2001; Cummins 2000), but the amount of FL knowledge required for these benefits to manifest is substantial (Lightbown and Spada 2006). Can CLIL render these cognitive effects? In CLIL, the time of exposure to the FL is significant (9–10h. a week in Madrid) but then, the FL is not normally used outside the class, so very high levels of language competence could be difficult to attain. Apparently, the cognitive advantages of the enhanced yet limited communicative competence that CLIL affords have not been defined yet.

At this point of the chapter, we must acknowledge some of the limitations of our study. One of its main caveats is that participants were asked to report on their own performance. Further research will involve contrasting the data with performance-based data, collected through classroom observations, to explore for example how debates and discussions are applied and effectively monitored by teachers in the CLIL primary classroom. Independently of this limitation, not only has the important role of debates and discussions in the CLIL setting been confirmed by the results of the questionnaires but also admitted by the teacher assistants, student teachers and novice practitioners with whom we are in contact in our daily teacher training activity⁴:

“En las clases de CLIL se da mayor importancia al diálogo entre los alumnos y se utiliza el debate para potenciar eso” (In CLIL classes dialogue between students is very important and debates are used to enhance it). (Interview n° 8-AZ)

⁴These interviews with student teachers and teacher assistants participating in the CLIL context are part of UAM-ETNA, the corpus of English Teachers’ NARRatives. UAM-ETNA is an initiative of the DAIC (Discourse Analysis and Intercultural Communication) research group working in FL teacher education at UAM (UAM SOC PR-009). UAM-ETNA is meant to be used as a source to describe the main characteristics and evolution of both pre-service and in-service ESL teachers’ professional identity working in primary and secondary education in Madrid, through the discourse and lexico-grammatical study of their oral and written narratives (Alonso-Belmonte 2012, 2014).

“Al aprender Science en inglés los debates se convierten en un instrumento crucial para poder verificar que los alumnos entienden y siguen la clase sin dificultad” (When learning Science in English, discussions become a crucial tool to test whether students understand and follow the class without difficulty). (Interview n° 15-RR)

In addition, we acknowledge that the number of questionnaires gathered in this study is limited and that the data refer only to receptive language skills. Hence, results reveal just trends and not generalisations. However, the scarce use of other higher order thinking tasks reported by teachers in this study lead us to think that, except for the predicting and discussion practices, and possibly problem-solving and information transfer, no special emphasis is placed on developing the students' analytical skills. In a context where learners are confronted with cognitively demanding content matter, it seems that they are not ably guided on what they should do with that content. This may be due to their teachers' deficient preparation to provide this guidance. Many authors stress the need for in-service training as expressed by teachers themselves (Asser and Mehisto 2007; Cabezuelo and Fernández 2014; Fernández and Halbach 2011; Pena Díaz and Porto Requejo 2008; Pérez Cañado 2014; Travé 2013). Besides, European CLIL teachers seldom receive extensive pre-service training (European Commission 2012). Therefore, it stands to reason that many teachers have a limited repertoire of strategies to foster critical thinking in the integration of language and content (Mehisto 2008).

All in all, teacher education should meet this demand and cater for CLIL teachers' need for training. In pre-service tertiary teacher education, we suggest that ESP language subjects such as 'English for education' and general English courses offer reinforcement on how to foster HOTS in the CLIL classroom. Concerning discussion tasks, student teachers can be trained in the application of specific techniques to manage a debate, and on the variety of questions that could be posed to promote well-informed reasoned discussion. Secondly, predicting and hypothesising make sense in mainstream FL teaching as pre-comprehension tasks to help establish a purpose to read or listen. Likewise, in teacher training for CLIL these tasks can be consciously encouraged as top-down approaches to oral or written texts for preparing learners to process the content matter *for a reason*, so that they are able to check, judge, and test over that content later on. Furthermore, student teachers would benefit from preparation in a variety of strategies and techniques to practise HOTS during comprehension of texts such as problem solving and information transfer activities. The former has to do with analysing and finding a solution; the latter, with constructing a new (linguistic) product, both HOTS in the cognitive process dimension.

In any case, creativity must be at the core of teacher education for cognitive development in CLIL. In the words of Cross (2011: 2), “language learning is [...] inextricably tied up with an appreciation of not only what words “mean”, but the feelings they also come to evoke through “sense” [and] learning and using language is, therefore, a necessarily creative process, inseparable from emotion and affect”. In this sense, creativity is not related to the usual artistic activity of, say, composing music; it is a mundane task that unfolds by using the language for doing something. Content-oriented CLIL, full of educational challenge and novelty, seems the natural scenario for this type of creativity, and student teachers need to be made aware of its

potential. In relation to this, some very useful ideas on tools and techniques for promoting critical and creative thinking skills in CLIL can be found in Hanesová (2014).

For instance, teachers can make use of graphic organisers such as mindmaps for the visual organization of information to activate background knowledge, or to provide scaffold when revising. Another means to encourage critical and creative thinking skills are brainstorming techniques such as SCAMMPERR (Eberle 2008; in Hanesová 2014), a mnemonic list of questions that stimulate the production of ideas: SCAMMPERR stands for ‘Substitute, Combine, Adapt, Magnify/Minimise, Modify, Put it to some other use, Eliminate, Rearrange and Reverse’. These words are prompts to create new ideas, solutions or products based on the expertise of students. Other strategies that assist students’ autonomous learning for the active construction of new knowledge are analogies, summaries, semantic networks, conceptual maps and portfolios. Also, discussions and the exchange of ideas in pairs or groups increase the benefits of CLIL by ensuring learners’ involvement in social interaction. Using these techniques and tools does not guarantee the development of critical and creative thinking skills, as their choice must be based on the students’ needs analysis of, for example, their learning styles. Nevertheless, experimentation with these techniques proves that the combination of CLIL and the development of critical and creative thinking skills is feasible (Hanesová 2014).

For these proposals to have a transforming power, they have to be part of an integrative model of teacher education (Escobar Urmeneta 2013), which brings theory and practice together through teacher-led enquiry, and comprises action research, classroom observation, university-school partnerships, etc. These experiences offer a better understanding of the connections across CLIL and provide a framework for collaboration between real practice and research-led theory. In this regard, at UAM we advocate for peer coaching meetings (Showers and Joyce 1996) with FL student teachers. Before the beginning of their practicum, peers self-select their pairs among their colleagues placed at the same school and get to know each other. Once in the school, student teachers regularly meet once a week not only to exchange experiences, expectations and fears but to offer feedback and constructive ideas too. Research evidence shows that peer coaching procedures have a positive impact on trainees’ professional development (Prince et al. 2010; Rodríguez Marcos et al. 2011) and in these sessions, the link between cognition, language and content can definitely be raised as an issue for FL student teachers to reflect critically on it.

7 Concluding Remarks

In this chapter we have attempted to contribute to the convergence between research, the teaching profession and teacher education by presenting a small-scale study on the activities that promote thinking skills in CLIL and proposing possible ways to enrich ESP training for teaching in CLIL based on our results. We believe that this line of investigation into cognitive development and thinking skills in education calls for critical engagement and is germane to the improvement of education in

relation to social justice. As we see it, critical thinking empowers learners to be independent responsible citizens and contributes to overcoming socio-economic inequalities and cultural differences. That is why it is particularly relevant to foster critical thinking skills adequately in widespread far-reaching initiatives of state education such as the CLIL provisions in the Region of Madrid. Thus, it is incumbent upon teacher educators to reflect on this issue and ensure adequate training in this respect.

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