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Academic Language Functions in CLIL discourse:

A classroom-based research study

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I seem to have travelled a long way since I first earned the chance to begin my PhD project on CLIL to now, when it is finally ready. During this journey I met several teachers, young researchers, academics and CLIL experts who enriched me with their experiences, skills, passion and knowledge. I would like to say thank you to all these people here.

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INTRODUCTION

Since the very first definition given by Marsh and Maljers in 1994, many researchers and academics have provided different interpretations of the acronym *CLIL*. However, all of them are likely to agree that it refers to an educational context where an additional language becomes the medium for teaching and learning non-language content.

> Content and Language Integrated Learning (CLIL) is a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language. That is, in the teaching and learning process, there is a focus not only on content, and not only on language. Each is interwoven, even if the emphasis is greater on one or the other at a given time.
>
> (Coyle, Hood & Marsh, 2010:1)

> Achieving this two-fold aim calls for the development of a special approach to teaching in that the non-language subject is not taught *in* a foreign language but *with* and *through* a foreign language.
>
> (Eurydice, 2006:7)

Some similar, earlier practices of teaching and learning can be traced in bilingual education and immersion classes in Canada and North America in operation since the mid-sixties. These new language acquisition approaches were justified by the need to cope with the differences affecting the new multilingual society and schools in those years (Swain & Lapkin, 2002). Under different circumstances, starting from the early 1990s, people equipped with a range of communication skills in more than two languages in Europe became the target of language policies aimed at dealing with their needs of mobility, multilingualism and internationalization. A boost to a new and more effective teaching methodology was thus supported by a series of papers issued by EU bodies and Institutions (European Commission, 1995, 2003, 2005, 2012 in Appendix

4) that viewed CLIL as a key instrument for meeting those needs (Dalton-Puffer, 2008). The *CLIL Compendium* (2002), for instance, lists some extra objectives that are specific to a CLIL dimension, especially for its linguistic implications, such as developing oral communication skills, introducing a target language and improving target language competence. Although it is still not fully accepted educational procedure, in the last ten years it has been notably implemented and articulated, becoming a suitable approach for providing better language-learning opportunities (Lyster, 2007).

The CLIL theoretical framework I myself will be referring to in this thesis has been influenced by the findings from existing research on different forms of bilingual education. Above all, CLIL shares certain important principles with some former communicative-oriented methodologies such as 'communicative language teaching' (CLT), "content-based language instruction" (CBI) in Canadian and US bilingual language teaching programmes and "task-based learning" (TBL). Despite its several forms, a content-based approach is thought to provide ideal contexts for second language learning to occur naturally because of the countless opportunities for authentic and purposeful use of the target language generated by the study of subject matter. CLIL is intended to be a melting of the best of these language and general educational theories and practices (Ioannou Georgiou, 2012).

However, which language acquisition theory best represents the seed of theoretical assumptions about CLIL is still controversial and second language acquisition researchers agree that the most relevant theoretical seeds underpinning the CLIL approach can be found in input and output theories, in particular Krashen's *Input Hypothesis* (1985) and Swain's *Output Hypothesis* (2000). The *Input Hypothesis* is only concerned with the 'acquisition' and not the 'learning' of the second language. Students improve following a natural progression when they receive second language input that is one step beyond their current stage of linguistic competence 'i+l'. The fact that in a CLIL lesson teachers and learners are focused more on the meaning than on the form, makes the input comprehensible, and so boosts the 'acquisition'. According to this theory, students are not forced into early production but they will come up with output when they feel ready. The acquisition occurs by providing communicative and comprehensible input, and not by pushing students to produce.

Hence, listening and comprehension will be the core of the language acquisition. Intended as a natural communicative approach, CLIL owes much to Krashen's *Input Hypothesis*. Nevertheless, the theory of second language acquisition achieved mainly by simple exposition to the language has been criticized, too. Among the most doubtful voices, of course, Merrill Swain's *Output Hypothesis* represents one of the most influential. According to this theory, it is the learners' output that facilitates and supports the acquisition of the second language, since during the act of producing the second language, students realize there is a gap between what they would like to say and what they are really able to. It is at that precise moment that students are "pushed to output" and will try and test new rules. It is easy to understand that in a CLIL context the role of the output is twofold. On the one hand, more mental effort is required from learners than during input, in order to produce language and to interact in order to take part in the "knowledge meaning dialogue" (Swain, 2000:99). On the other hand, the output represents the opportunity for them to demonstrate they have acquired the input received in the form of subject content. In this regard, Echevarria and Graves (2007) state that effective language learning occurs where the lesson provides either proper opportunities for interaction with teacher and peers or adequate practice in the target language. Through interactive instruction, learners are encouraged to use elaborate language on relevant topics, while building their second language skills and developing content knowledge.

Production and interaction also play an important role in the second language acquisition process in the sociocultural dimension, where the act of producing language and interacting with people is essential. From this perspective, considering this specific educational setting with its specific social players, the interactional exchanges lead to classroom discourse with a very high level of contextualization and complexity.

It is in relation to all these expectations that researchers have been investigating for years whether CLIL really succeeds in improving the learner's language competences in general, considering its specific characteristics with respect to the much more familiar immersion classroom contexts. In this case, in fact, results over the past 40 years have repeatedly shown that the "two for one" (Lightbown & Spada, 2006) approach is successful: immersion students who study subject matter through

their second language attain the same levels of academic achievement and first language development as non-immersion students, but attain significantly higher levels of second language proficiency than non-immersion students studying the second language as a regular subject for one lesson per day (Lyster, 2007). However, considering the previously described communicative nature of the CLIL approach, it is worth looking into its real effectiveness in terms of the learner's productive and interactive skills, especially if we consider that some former communicative-oriented approaches (French immersion programs in Canada) have partially failed, in terms of their development of communicative competence, as the results have demonstrated that the productive skills (speaking and writing) are not commensurate with the length of time of the experience (Coonan, 2012).

I wish now to outline the background where my research took place, recalling the earliest pre-existing CLIL experiences in Italy, the new legislative overview and the cutting-edge training path for the new Italian CLIL teachers. My research will focus on the Italian context and the main instructional setting worth investigating is the upper secondary school. In this relatively recent CLIL setting, the latest Reform of the education system (Indicazioni Nazionali Nuovi Licei, MIUR 2010a in Appendix 3) has placed Italy in the vanguard in the European Educational CLIL context. Before this Reform, in spite of the CLIL projects realized, there were neither any centralized CLIL measures nor any systematic and extended monitoring of CLIL initiatives. With the exception of bilingual and international programs in schools, it was with the introduction of the law on school autonomy (n. 59/97) and its regulation (DPR n. 275/99) that Italian schools were allowed to activate flexible CLIL modules autonomously. A series of CLIL initiatives, activated by regional and local education authorities as well as by individual schools and teachers, especially thanks to several projects and initiatives, began to flourish throughout the country (cfr. 1.3). According to the Italian school Reform (Gelmini, 2010), in line with European Union policies and as in most European countries, starting from school year 2012-13, the teaching of one of the subjects of the syllabus in a foreign language using CLIL methodology was introduced in the third year of *Licei Linguistici*, whereas other *Licei* and *Istituti Tecnici* were to introduce CLIL in the fifth year, beginning in 2014-15.

In Part 1 of the thesis, I will provide a picture of the state of art of CLIL in Europe (cfr. 1.2) and of the more specific CLIL context in Italy (cfr. 1.3). Despite the great efforts of the Italian Ministry, there are still a number of critical aspects. Although it is an approach promoted to develop the students' communicative competence in a foreign language and so in a clearly student-centred dimension, many studies (for example Casal, 2008) have underlined that CLIL risks encouraging a teacher-centred approach, where the teacher is absorbed in the task of making language understandable to the students and consequently simplifying the subject matter, while the students' role is often reported to be limited to focusing on passive skills (listening or reading) rather than on active production (speaking, interacting or writing). A large-scale study conducted in Canada (Netten & Spain, 1989) reported on the great differences concerning the teachers' ways of organizing and instructing their classes, and above all, how these differences significantly affect the pupils' learning outcome. Since teachers are required to enhance students' content language and their language development, they also play a central role in providing good quality interaction with students, intended as the opportunity to ensure that learning, in addition to communication, is taking place (Lyster, 2007). Indeed, Allen et al. (1990) have also stressed that teachers are expected to direct students towards the production of comprehensible output, through professionally planned and guided communicative practice. Avoiding this problem, probably due to the vague idea these teachers have about how to focus on language and consequently the low effect they risk producing on the learners' language development, is a question that the Italian Ministry of Education has faced promptly, making Italy the first European country to provide specific training for subject teachers involved in a CLIL educational context.

In section 1.3 I will provide a deeper analysis of the CLIL teachers' profile, limiting myself to providing some basic information here. The MIUR, (Italian Ministry of Education, University and Research), in cooperation with ANSAS (the National Agency for the Development of School Autonomy) has planned CLIL learning paths, focusing on both language and methodology, aimed at training the first generation of skilled CLIL teachers. MIUR establishes that Universities will run both language and methodology courses. Up to now, MIUR has financed approximately 200 courses in which, in the 2012-2017 period, about 8000 teachers were given language training at

different levels (B1-C1). Within the same period, about 4000 teachers were certified a B2-C1 competence in the foreign language and were also given CLIL methodology training. As far as my region is concerned – Lombardy –, methodology courses were run by the *Università degli Studi di Milano* and by *Università Cattolica*. Given the short time available to the MIUR for providing a number of properly trained CLIL teachers able to maximise the CLIL's potential also in terms of second language acquisition, there is still little evidence in Italy to confirm that this methodology offers students more opportunities for producing output and consequently for language acquisition itself, as theorized by Swain's *Output Hypothesis*.

In the educational context outlined above, my research is aimed at investigating CLIL classroom discourse and in particular cognitive functions of speaking, where academic language functions are a special instance of the general communicative functions of language. The method of analysis and the quantitative and qualitative findings related to the teacher's use of the academic function of making hypotheses will be provided in the second part of my thesis. Nowadays, it is commonly accepted that managing control over the numerous academic language functions is essential to the development of communicative competences (Dalton-Puffer, 2013). However, although these language functions occur quite frequently, it is worth investigating how suitable a CLIL lesson is for encouraging the learning of these functions. The wide field of academic language functions can be simplified using Kidd's taxonomy (1996) which groups them into micro-functions and macro-functions mainly according to the length of the stretches of discourse they cover. In fact the latter deal with longer ones and cannot be clearly related to specific lexicogrammatical features.

Among the most frequent academic language functions, such as *defining, explaining, hypothesizing, justifying, evaluating*, I will focus on how hypothesizing is embodied in the Science CLIL classroom discourse. This choice is based on two main reasons. The former is that the activity of hypothesizing is a mainstay in scientific school subjects such as Biology, Chemistry or Physics. The latter is the richer linguistic potential and greater linguistic complexity provided by this language function in terms of lexicogrammar and verb phrases that it implies.

PART 1: BACKGROUND

The first part of my thesis aims to provide the background to my research. In particular, I will first introduce a concise review of the CLIL literature and in particular of the studies on CLIL classroom discourse and on Academic Language Functions (ALF) in CLIL contexts. I will then describe the European and the Italian CLIL contexts, with particular reference to the CLIL policies that have influenced the language education discourse, the CLIL teacher profile and training programmes.

1.1 CLIL: A LITERATURE REVIEW

The aim of this chapter is to present a concise selection from a sizeable body of CLIL literature published recently. The growing interest in CLIL all over Europe, especially over the last 10 years, has resulted in an ever-increasing and notable body of CLIL-related literature, in which a wide range of issues has been investigated. Empirical studies have been conducted in a variety of contexts with different settings, participants and aims. This high degree of contextualisation does not make generalised conclusions about CLIL possible and, above all, it confirms that consolidating research is still needed (Nikula, Dalton-Puffer & Llinares, 2013:73). In particular, distinguished experts and researchers have offered up-to-date overviews of the CLIL studies conducted in Europe, where CLIL finds its natural development (e.g. Dalton-Puffer, 2008, 2011; Dalton-Puffer & Smit, 2013; Nikula, et al., 2013; Marsh, Pérez Cañado & Padilla, 2015) and their findings will be the starting point for this review. I will devote the first part to the review of the studies which investigated CLIL classroom discourse, understood as the environment where "the processes of constructing meaning within particular educational events" (Dalton-Puffer & Smit, 2013:551) take place. Within this context my focus will be twofold: the studies looking into the effects of CLIL education on learners' language outcomes and those that analysed the impact of CLIL on learners' content outcomes. In the second part of this chapter I will review the studies that dealt with the same phenomena I decided to tackle in my research, that is the use of ALF in CLIL contexts. Without claiming to be exhaustive, the findings that have emerged from this selection of studies can be regarded as representative of a

much wider body of literature.

1.1.1 CLIL classroom discourse

CLIL classroom-based research has dealt with a considerable array of issues. Here I will propose a brief overview of the studies investigating the impact of CLIL on learners' language outcomes and on content outcomes, too. I will also report on some studies that have cast doubts on the real efficacy of CLIL teaching and highlighted the lack of indisputable benefits for learners. Finally, I will refer to some studies whose findings have shown that CLIL had neither positive nor negative effects on the learners' outcomes.

Considering that CLIL has been cast in the role of "catalyst for change in language education" (Marsh & Frigols-Martín, 2007:33), it is not surprising that most of the research on outcomes is in the area of attainment of language competences. Generally speaking, the vast majority of studies conducted on CLIL contexts in Europe confirm the positive effects of CLIL education in terms of students' language learning outcomes. As CLIL students nearly always continue to attend their regular foreign language lessons alongside their CLIL learning experience, they have an obvious time advantage over their peers and they are expected to achieve higher levels of competence in the foreign language than their mainstream peers. A reasonable body of literature confirms this expectation (Lasagabaster, 2008; Ruiz de Zarobe, 2008; Lorenzo, Casal, & Moore, 2009; (Lagabaster & Ruiz de Zarobe, 2010). Even so, the question of how much and in what respect CLIL students are better remains debatable, as does the question of why (Dalton-Puffer, 2011:86).

To understand whether there are conditions in CLIL discourse that enhance the participants' mutual engagement in talk, Dalton Puffer (2008:7) reports on two case studies (Gassner & Maillat, 2006; Nikula, 2007) in which CLIL classrooms were compared to complementary teaching contexts, namely foreign language classrooms or mother-tongue subject teaching. CLIL education seemed to produce effective gains for the learners in both cases. However, the results of studies conducted in the Basque countries (Ruiz de Zarobe & Catalan, 2009; Ruiz de Zarobe & Lasagabaster, 2010; Ruiz de Zarobe, 2011) and in other European countries in a wide range of contexts

(Admiral 2006; Dalton-Puffer, 2011) have demonstrated unanimously that only some aspects of language are favourably affected by CLIL education, namely vocabulary, listening skills, morphology, creativity, and spontaneous oral production amongst others.

On the other hand, other studies into the learners' language usage in the CLIL classroom showed that CLIL students used English only in very limited situations and during teacher-student interactions; even the answers given by the learners were minimal (Dalton-Puffer, 2007). Similar studies (Parés Cortacans, 2013) confirm the deficit in CLIL learners' oral production, and some eminent researchers (Dalton-Puffer, 2008; Ruiz de Zarobe, 2011) reported that syntax, writing, pronunciation and pragmatics are areas in which CLIL did not have a significant effect.

Overall, teaching content through a foreign language has the potential to render classroom discourse qualitatively different from contexts in which language is the object of investigation. The biggest differences relate to the increased opportunities for students to be active participants in interaction and the use of the target language for contextually relevant meaning making. However, these differences are influenced by pedagogical practices and the gains are less obvious if teacher-centred methods prevail (Dalton-Puffer, 2013) and teachers are not trained to promote oral communication in their lessons.

The second issue dealt with in these reviews regards the effects of CLIL on the students' content outcomes. Although findings are less conclusive in this regard than those on language outcomes (Dalton-Puffer, 2011), the results to date are generally positive. Generally speaking, CLIL learners acquire the same amount of content knowledge as their peers who are taught in the L1, contradicting those who feared that the CLIL approach would result in an oversimplification of the content. Some researchers indicate that, in certain cases, CLIL students outperform their non-CLIL counterparts. Van de Craen, Ceuleers, & Mondt (2007) observed a group of young Belgian CLIL Mathematics learners who outperformed their peer control group even when tested in the L1. Surront et al. (2013) conducted a longitudinal study with a group of learners in their first year of secondary school in Flanders. Findings supported the positive effects of CLIL on their performance in Mathematics, and consequently

confirmed the non-detrimental effect of the CLIL approach on the subject-content taught.

However, after a period of unbridled enthusiasm, a more critical attitude has set in (Bruton, 2011; Cenoz et al., 2013; Paran, 2013), with many claiming that CLIL instruction is not always necessarily that beneficial. The assumption that CLIL produces better results than the alternatives it competes with, content-based language teaching (CBLT) and content language teaching (CLT) is not necessarily given. According to these studies CLIL has definitely lost the allure that was initially engendered by the novelty of the method. Now the CLIL scenario appears controversial on several fronts. Burton (2011) for example reported a series of studies conducted in Spain and in the Basque autonomous community, and reconsidered their encouraging CLIL findings, above all due to a series of caveats in CLIL research. Perez Cañado (2016) collected his observations and extended the limits of the CLIL studies categorizing them in terms of variables in the research, research design, and the statistical methodology. Critical voices are beginning to make themselves heard, especially in reports on studies published in languages other than English. Lim Falk (2008), who investigated a CLIL context in Sweden, found that CLIL students used less relevant subject-based language in speech and writing than the control-group students. A longitudinal study conducted in Germany (Dallinger et al., 2015) carried out an investigation of the skills development of 1,806 German CLIL and non-CLIL eighth-graders in English and History. The findings confirmed that CLIL students showed greater improvement in listening comprehension (but not in general English skills), as measured by a C-test[1], than non-CLIL students. As to the subject content, they indicated that CLIL students needed to invest substantially more time to achieve comparable learning outcomes (they received one extra hour of instruction per week).

Finally, a number of studies reviewed in Dalton-Puffer (2011) reported neither positive nor negative effects of CLIL on the learners' content outcomes. Admiraal et al. (2006) conducted a quantitative survey in the Netherlands to investigate whether the CLIL students had better results in L1 university entrance exams in History and

[1] A *C-Test* consists of several short texts, in which every third word is incomplete. Your task is to complete the missing words.

Geography. The findings showed they were neither better nor worse than their peers. Moreover, Admiraal et al. (2006) pointed out that the results of bilingual education in the Netherlands at the time of data collection had been affected by an exceptional contribution from particularly motivated students and teachers. The uniqueness of the context should be enough to avoid any overgeneralization of the outcomes. The second study was set in Finland. Jäppinen (2005) compared three groups of Finnish CLIL and non-CLIL Mathematics learners. The findings indicate weak negative effects on the subject-content outcomes for the youngest age group (7–9), slightly positive effects in the middle group (10–12) and zero effects for the older learners (13–15). Last, Badertscher and Bieri (2009) conducted a study in Switzerland where German and French were the two languages of instruction. It was a longitudinal study involving 6 classes (4^{th} to 6^{th} grade). They combined oral subject-knowledge interviews with classroom observation and the findings showed that CLIL had neither positive nor negative effects on the students' performance in the subject-knowledge interviews.

1.1.2 Academic Language Functions in CLIL contexts

Successful learning has to translate into the learners' ability to articulate their knowledge and understanding appropriately (Meyer et al., 2015:44). In this section, I will provide a brief overview of the classroom-based studies that have dealt with the use of academic language functions in CLIL classroom discourse, which is also the focus of my research. The studies I will mention will offer some elements of comparison with my study. The CLIL classroom is an academic learning environment *par excellence*, in which the cognitive discourse functions that structure and drive academic discourse lie at the interface between thinking and language, and become essential objectives of the learning curriculum (Bonnet et al., 2009:175). Dalton-Puffer (2007) emphasises that the CLIL classroom provides the potential for learning academic language in another language that is unlikely to be learnt in other contexts.

A recent study conducted in Castilla-La Mancha (Spain) among secondary school students in their second year investigated the influence of bilingual education on the acquisition of the key competence of learning to learn (Moreno de Diezmas, 2016). The findings showed that bilingualism had a significant effect on the acquisition

of this competence too. In particular, the students also displayed a higher mastery of lower and higher thinking skills - LOTS and HOTS[2] - than their counterparts, along with a greater expertise in reflecting on their own learning processes and on what their own abilities and their own learning outcomes were.

To the best of my knowledge, the only studies that have investigated ALF in a CLIL classroom context are still very scarce (Dalton-Puffer, 2007; Lackner, 2012; Kross, 2014; Martìn Del Pozo, 2015). Moreover, they differ greatly as to the grade of education and the subjects involved, and as to the types of ALF investigated. The first of these studies (Dalton-Puffer, 2007) was conducted in lower- and upper- secondary school CLIL classrooms in Austria. Dalton-Puffer examined teacher and student talk from different discourse-analytic angles. Embedded in this general context, she also investigated how far CLIL lessons could be considered rich environments for the learning of academic speech functions. In particular, her investigation concentrated on three functions: *defining, explaining* and *hypothesising*. With regard to the last ALF, which is also the main focus of my research, it emerged that, despite the importance of hypothesising for cognitive and L2 language development, the formulation of hypotheses rarely occurred in the Austrian CLIL classrooms observed. She counted "less than one instance of hypothesising per lesson. In real terms this means that there are numerous lessons where possibilities, probabilities, predictions or consequences are not talked about at all" (Dalton-Puffer, 2007:167). Her final results suggest that in order to fully exploit the potential of the CLIL programmes, teachers should make their language goals explicit.

Dalton-Puffer supervised two 'Diplomarbeit' studies on the use of discourse functions in CLIL lessons (Lackner, 2012; Kross, 2014). Both were conducted in Austrian upper secondary schools. In the first study, Lackner (2012) examined two macro functions (*explaining* and *describing*) and two micro functions (*defining* and *classifying*) in 18 upper-secondary CLIL History lessons taught by three teachers. The choice of these four academic functions was justified by the fact that they "play a central role in the construction of knowledge in history lessons" (Lackner, 2012:40).

[2] Higher Order Thinking Skills and Lower Order Thinking Skills refer to the taxonomy developed by Bloom in 1950s in order to describe different kinds of thinking. The taxonomy provides a way to organize thinking skills from the most basic to the more complex levels of thinking.

The investigation aimed at identifying the frequency and the realization of the discourse functions in History classroom discourse. The findings of the study revealed that these academic functions could not be considered frequent phenomena in the CLIL History classroom.

Another study, by Kross (2014), investigated how the construct of cognitive discourse functions (CDF) was applied in the classroom. This classroom-based research was conducted in the Austrian upper secondary schools, too. Kross examined six CLIL Physics lessons taught by three teachers. According to the seven cognitive discourse functions types proposed by Dalton Puffer (2013), Kross analysed: *classifying defining*, *describing*, *evaluating*, *explaining*, *exploring* and *reporting*. The quantitative findings showed that all the seven occurred in the six lessons observed, with an average of 16 occurrences per lesson, that is, one discourse function every three minutes. However, the distribution of the seven discourse functions varied according to the teachers and lessons. *Describing* accounted for more than a quarter of all instances, while there were hardly any occurrences of *classifying* and *evaluating.*

The last study by Martìn Del Pozo (2015) was conducted at the Escuela Univesitaria de Informatica (Universidad de Valladolid, Campus Segovia, Spain). Whereas in the previous three studies both teachers and students were studied, Martìn Del Pozo investigated only six lecturers teaching different subjects in English, ranging from Economics to Maths and Physics, amongst others. The focus of her research was on how the six lecturers used the academic functions of *defining*, *explaining* and *hypothesising*. With reference to the number of occurrences of *hypotheses* collected in the above studies, a quantitative comparison reveals an average of five occurrences counted per class in the university lessons while only one occurrence was observed in the study conducted in the Austrian secondary schools. As far as hypothesising is concerned, Martìn Del Pozo concludes that lectures focus mainly on conveying information and not on cognitive activities that require the use of hypothetical expressions.

To sum up, more in-depth research is needed to explore how far a CLIL context can become a rich educational environment for practicing ALF. The study I carried out hopes to make a small contribution to this field of research.

To conclude, CLIL research generally confirms the beneficial effects of CLIL with respect to traditional language-driven teaching. However, an increasing number of studies have highlighted a number of controversial issues related to this field of study. As Marsh et al. (2015) explain, a prevalent reason for an aversion to CLIL is that some serious methodological flaws have been observed in the way research into CLIL is conducted. The first regards the variables of the research. Samples are only very rarely guaranteed. The second relates to the research design. Usually no post-tests or control groups are considered and more longitudinal studies would be required. These limitations may well compromise the validity of outcomes. In addition, whereas there is wide consensus regarding the positive effects of CLIL in terms of language abilities, research into content knowledge is difficult to conduct and needs to be intensified (Marsh et al. 2015), particularly because of the lack of standardised testing in non-language subjects. Thus, quantitative surveys and cross-country comparisons are more problematic than those regarding language attainment (Dalton-Puffer, 2011). The CLIL terrain must continue to be mapped so that the CLIL teacher will be the first to benefit from more generalizable findings: "If all these three strands: implementation, research and training – dovetail and progress in harmony, a solid template will be built for the future and the CLIL agenda will hopefully be pushed forward" (Marsh et al., 2015:8).

1.2 CLIL IN EUROPE

From the creation of the EU onwards, it immediately became clear that Europe would be a multilingual entity and that greater effort would need to be made to ensure that education systems provided language education for more young people (Coyle et al., 2010). Nowadays, after about 35 years, good language education has become an expected prerequisite for all those millions of students and workers who move between countries and use English as a medium of instruction and communication. This means that a high level of language competence must be provided. However, very often given the time invested within the curriculum the levels of students' competence in English have been considered too low, (Marsh & Frigols-Martín, 2007), and therefore a decisive improvement in the practices of English language learning and teaching in

Europe is a priority. In this regard, CLIL represents the most significant step towards upgrading the systems of teaching and learning English. Nevertheless, only a few of the 28 European countries, Italy among others, have invested substantially in the implementation of CLIL and CLIL teacher training. The others have handed the initiative of promoting language development over to educational institutions and other stakeholders.

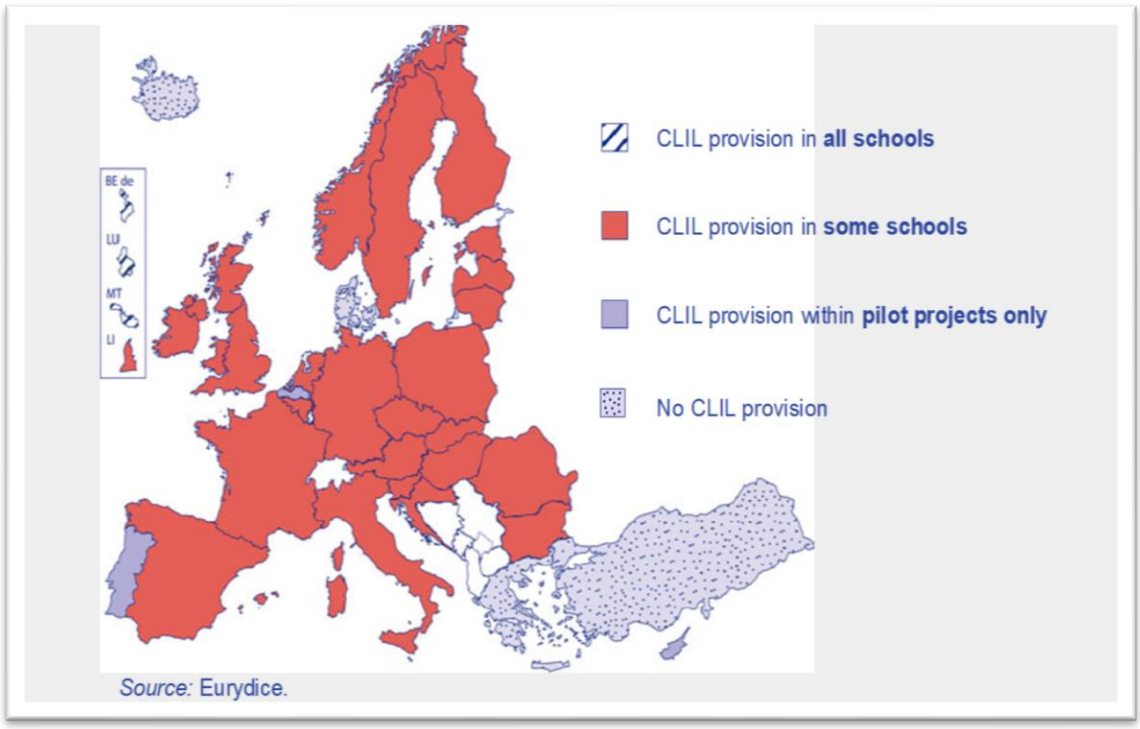
In this chapter, I will deal with CLIL as a strategic solution in education in some European countries, Italy in particular, to satisfy the expectations of Europe as to plurilingualism (Appendix 1). The first part of this chapter comprises an analysis of the wider European CLIL context, while the second part is an investigation of the more specific CLIL context in Italy. For both contexts I will concentrate on: 1) the history of CLIL summarised in relation to actions that have influenced the language education discourse; 2) the state of CLIL determined from the contents of documents, research and surveys; 3) the profile of the CLIL teacher and the related CLIL teacher training programmes.

In reference to the history of language education policies in Europe, I will provide a chronological account of the most effective CLIL-oriented actions and policies at supra-national level.. This selection of papers and projects results from my personal choice of documents from a considerable body of material that it would not be possible to report here in its entirety. However, they are representative of the main issues and strategies of the supranational stakeholders in terms of the promotion of foreign language teaching, (CLIL) teacher training and bilingual education. The selection is drawn from the official websites of the European Council and its Commissions, the European Centre for Modern Languages (Appendix 4) and some relevant academic publications (Trim, 2007; Marsh et al., 2001).

The intense activity of the EU with respect to promoting new teaching and language learning methodologies was also documented at some important professional CLIL conferences that took place throughout Europe, such as those in Haarlem (1996), Luxemburg (2005), Helsinki (2006), Tallinn (2008), Eichstätt (2010), Utrecht (2012), Ustron (2013) and Venice (2014) (Dalton-Puffer, 2015). Moreover, the activity of CLIL implementation in Europe was also monitored by the European Commission and reported in several documents (Eurydice, 2006; Windows on CLIL, 2007; ECML,

2007; Eurydice, 2012; EC 2014). Figure 1 shows CLIL provision in primary and/or general secondary education in 2010/2011 (Eurydice, 2012).

Figure 1: CLIL provision in primary and/or general secondary education in 2010/2011



CLIL exists in nearly all the countries in Europe. However, it is not necessarily widespread across the various education systems (Eurydice, 2012). In addition, despite the EU's strong and constant supportive actions in favour of CLIL, each country decides how it wishes to apply CLIL, designing its own educational and language policy. This explains the wide variety of "CLILs" across European countries, each with its particular features resulting from its own linguistic history, education policy, social context, needs and aims. For example, at the time of the Eurydice survey (2012):

- Austria offers CLIL from the primary schools onwards.
- Belgium, Luxemburg and Malta students are generally taught in at least two foreign languages.
- Denmark, Greece, Iceland and Turkey are the only countries that do not

provide any CLIL teaching path throughout their educational systems.

- The history of CLIL implementation in German schools dates back to the first bilingual German-French programmes in the 1960s. CLIL programmes in English started to spread in the 1990s and were fully developed after 2000.
- In Poland: due to the new education Reform in 1999, CLIL started to be implemented in lower secondary schools, too.
- The Netherlands were the first to respond positively to the Maastricht Agreement and began to implement the idea of developing European plurilingualism and bilingual education in 1991. In 2013 almost 150 schools (out of a total of 532) offered bilingual education in the Netherlands (Kuiken, F.; van der Linden, E.H., 2013).
- In countries such as Great Britain, Spain, Germany, Italy, Sweden etc. there has been a combination of CLIL provision as part of mainstream school education and through pilot projects.
- Only Lithuania and French-speaking Belgium have introduced CLIL in pilot projects. Finally, most countries have introduced legislation to establish CLIL in schools in order to make its implementation homogeneous and organized.

Despite the great variety of European educational contexts in which CLIL has been implemented, it is possible to identity some common features of CLIL-based teaching: (Dalton-Puffer, 2015)

• the language used is a foreign language or lingua franca
• the dominant CLIL language is English
• CLIL teachers are non-native speakers
• CLIL teachers are content experts
• CLIL is timetabled and assessed in the same way as content lessons
• FL lessons continue alongside the offer of CLIL
• typically, less than 50% of the curriculum is taught in the target language
• CLIL can build on learners' L1 literacy skills

Above all, the various forms of implementation of CLIL in Europe share one primary

objective, as explained by Ruiz de Zarobe (2013:231-243) in the following:

> All in all, and despite the hegemony of English as a global language, CLIL has been conceived to enhance language competence and communication in an ever-growing multilingual society where, in the case of the EU, 23 official languages coexist with more than 60 regional or minority languages, some of which have official status (Basque, Catalan and Sami, among others). […] This multilingual diversity calls for an educational approach that can become an appropriate vehicle for intercultural communication. Consequently, CLIL can be understood as a truly European approach for the integration of language and content in the curriculum as part of the international mosaic of multilingualism.

The last aspect I will consider concerns one of the biggest unsolved issues regarding CLIL, namely the qualification and training of CLIL teachers, the quality of which is obviously considered essential for CLIL classrooms and for education in general. There is no single recipe for CLIL and its success depends on numerous variables, such as the local context, needs and resources, and the students and their attitudes and motivation. However, the language and pedagogical competence of CLIL teachers thanks to initial and ongoing professional development training (PD), is also recommended by the ECML (2014). The methodological choices they make are the result of their theoretical and practical background and their CLIL-oriented education. The pedagogical expertise of CLIL teachers is crucial for the success of their programmes (Frigols-Martin et al., 2011). Without neglecting the high number of variables in the implementation of CLIL and the complexity of the wide European context, boosting and maintaining the quality of professional development programmes for CLIL teachers is therefore crucial for the achievement of the ambitious objectives set by the EU in terms of bilingual education. However, the training of CLIL teachers is also managed individually by individual countries, which design different training paths in accordance with the aspects they decide to prioritise. As far as language competence is concerned, at least B2 of the *Common European Framework of Reference for Languages* (CEFR) is commonly required by European

States for their own CLIL teachers. However, the most suitable methodological competence for CLIL teaching is still largely debated. For example, Mehisto et al. (2008) report on a review of interviews with teachers who were asked what factors helped them to achieve success in their CLIL programme. Training opportunities, support by Immersion Centres and teaching materials were ranked as the most important factors in CLIL programmes. As regards the development of CLIL training in the UK, Hillyard (2011:7) highlights that:

> Teachers must be thoroughly trained in lesson planning and have knowledge of lesson preparation, translating plans into action, ensuring outcomes, understanding of second language attainment levels, promoting cultural awareness and interculturality, applying knowledge about second-language acquisition in the classroom, and having knowledge and awareness of cognitive and metacognitive processes and strategies in the CLIL environment.

Other recent studies on Professional Development experiences that impact CLIL teacher practices have confirmed the variety of CLIL teacher-training models offered in Spain (but not only there), as summarized below:

- At the inception of its CAM Bilingual Project in 2004, the Alcalà Univeristy designed a teacher-training programme that was mainly linguistic. A few years on, the methodological component in the training has become more important, but teachers wanting to work in the project are still tested in terms of their language proficiency only (Olivares Leyva & Pena Diaz, 2013).
- Escobar Urmeneta (2013) investigated a pre-service CLIL teacher-education programme included in a master's degree in Barcelona, where the main pedagogical choice was to achieve teacher empowerment through cycles of collaborative teaching and shared reflection. The analysis traces student-teacher progress, both in the practical handling of the specific challenges presented by the CLIL lessons and in the teacher's progressive understanding of key issues in the domain of Second Language Acquisition (SLA); it also shows how teaching practice and reflection shape and fuel each other.

- In Slovakia, a twofold and differentiated programme is suggested by Pokrivckova (2015). She proposes new courses in higher education for CLIL pre-service teachers, but essential subject content courses for the language teachers to give them basic insight into the subject field.
- According to Hillyard (2011:9) the most efficient approach, if not the speediest or cheapest, might be to train a group of teachers who then teach in real classrooms for two years while attending monthly meetings to reflect on problems and successes, and who then participate in a "train the trainers" course in which they learn how to train other teachers, using a "cascade" model and thereby disseminating the methodology as widely as possible.

Finally, large scale investigations into the competences and methodological skills teachers should master resulted in larger-scale standardised frameworks for CLIL teachers such as the following: *The CLIL Teacher's Competences Grid* (Bertaux et al., 2009), the *CLIL Teacher Profile* (EUCLID, 2011), and the *European Framework for CLIL Teacher Education* (Marsh et al., 2011). The *European Framework for CLIL Teachers* represents a helpful tool for teachers, who can use it to evaluate their competence and progress, and especially to reflect on their practices. The use of clear descriptors ("is able to …") is very effective. Obviously, a well-trained teacher is necessary in any successful educational programme, but this is probably truer for dual-focused programmes.

1.3 CLIL IN ITALY

In this second part of the chapter I will hone in on the implementation of CLIL in Italy, in which the main characteristics are shared with the tradition of some other European countries but which, at the same time, has interesting breakthrough aspects. I will provide an account of CLIL in Italy by reporting selected and effective CLIL programmes in the country in the last 20 years. After this, a picture of the present Italian CLIL context and the emerging varieties of CLIL implementation is traced by analysing and comparing the findings of two national surveys conducted in Italy in 2013 and 2015. Some studies of the Italian CLIL context (Di Martino, E. & Di Sabato, B., 2012; Cinganotto, L., 2013) complete the framework of my report. The 2010

Reform of the Italian secondary school system and its CLIL policy implications are considered in the last part of the chapter, with a close focus on the Italian CLIL teacher profile and the in-service teacher training.

In Italy, the first CLIL teaching experiences can be traced back to those of individual teachers and some local and autonomous initiatives in the mid 1990s. Then, a number of interesting projects, together with legislative decisions in some regions, led to the attempt to unify the national offer of CLIL, which became a reality with the 2010 Reform of the secondary school system. In the following paragraphs, I will summarise the main phases of the history of CLIL in Italy up until the 2010 Reform of the national education system. In 1993 the launch of the *Liceo Classico Europeo* can be considered the first official attempt in Italy to promote content and language-integrated learning in the secondary school system (Langé, 2014). Its new curriculum encouraged the use of a foreign language as a medium of instruction in at least two school subjects. A few years later, according to the new regulation on the autonomy of schools, DPR. n. 275/99 (MIUR, 1999 in Appendix 3), "schools were allowed to adapt teaching timetables, curricula and didactics to their students' learning needs". They could also provide extra-curricular education and activities according to their cultural, social and economic context. More and more schools gradually took advantage of this new autonomy and offered the teaching of one or more subjects through the medium of a foreign language, even just for some modules throughout the school year rather than the entire year's schedule.

A certain number of regional projects were rolled out, especially in Northern Italy, which focused mainly on providing suitable initial training for CLIL teachers and designing CLIL materials intended to be shared by the practitioners. A chronological account of the most prominent regional and national CLIL projects is given below:

- 1997: *Progetto Lingue 2000*. The project was financed by the Ministry of Education by law 440/1997. Its objective was to innovate the teaching and learning of foreign languages from primary to secondary schools. It proposed a series of important changes such as the introduction of new technologies supporting language learning, the study of a second foreign language from the

Scuola Media (11-14 year old students) onwards, and a special focus on the acquisition of the communicative key competences in a foreign language.

- 1998: *TIE-CLIL* (Translanguage in Europe – Content and Language Integrated Learning). It was financed by the project "Socrates – Lingua A" (1998-2002) and involved 10 partners from 7 European countries. It was aimed at designing materials and resources for the initial and in-service professional development of both language and content teachers.
- 1998: *ALI-CLIL* (*Apprendimento Linguistico Integrato – Content Language Integrated Learning*) *Lombardia*. This started in 1998 from the activation of the TIE-CLIL.
- 2002: *Apprendo in Lingua 2: Educazione bilingue: l'uso veicolare della lingua straniera* (2002-2004). This project was promoted by USR Veneto and supported by the Università Ca' Foscari of Venice. Training a group of skilled CLIL teachers and sharing innovative and good teaching practices for the benefit of further CLIL students were the two specific objectives put in place in order to improve the secondary students' oral competences in a foreign language.
- 2003: *Lingua, Cultura e Scienza: apprendimento integrato di lingua e contenuti*. This project was set up in Piedmont in 45 classes from primary, middle and secondary schools. It focused only on scientific school subjects, which were

taught in English, or French or German. The main objective was to build up a common CLIL teaching path that would be used in teaching Science.

- 2010: *IBI/BEI* (*Insegnamento Bilingue Italia/ Bilingual Education in Italy*). This project started in 2010 from a partnership between the Italian Ministry of Education, Research and University (MIUR) and the British Council of Milan. It involved 6 selected primary schools in Lombardy that could rely on teachers with at least a B2 (CEFR) in English. Moreover, each school guaranteed dedicating at least 25% of their weekly schedule to the English teaching, involving not less than 50% of their classes in the first year. The project was to be developed for the whole 5-year primary school cycle.

- 2011: *E-CLIL – per una didattica innovative*. MIUR addressed this project mainly to the fourth year of secondary schools and it aimed at combining the learning of subject content together with the development of both foreign language and digital competences through the new technologies (Langé, Cinganotto, 2014).
- 2013: *Read on for ECLIL: Read on!* It is an extensive reading project for schools in Italy aimed at stimulating effective language learning, not only for second language acquisition but also for consolidating skills in the mother tongue. To date, more than 400 teachers and 5,500 students have benefited from the *Read On!* methodology and the project has attracted considerable interest within the Italian Ministry of Education and beyond. The British Council helped to set up *Read On!* in Italy with the cooperation of Oxford University Press, and the patronage of the British embassy.
- 2016-2017: *Tecno CLIL for EVO*. Promoted by Electronic Village Online (EVO) this was a free, online course aimed at spreading CLIL methodology, combining teaching strategies and technical tools and eliciting reflections and discussions among teachers from all over the world, through synchronous and asynchronous web meetings. Weekly webinars with national and international CLIL experts was a highlight of the session, with each speaker moderating a follow-up discussion in the session forum.

In 2010 CLIL was officially introduced into the Italian school system as part of a wider Reform of secondary education known as "Riforma Gelmini" - DD.PP.RR. nn. 88/2010, 89/2010 (MIUR, 2010 a,b). In this way, the Government implemented what had already been planned in 2003 (legge n. 53/2003) by a previous Minister for Education (Moratti). This 2010 Reform of the Italian education system made CLIL teaching in at least one foreign language compulsory from the third year of language schools and in the fifth year of all upper secondary schools except for the vocational schools. Moreover, the language schools are encouraged to provide a second CLIL cycle through another foreign language from the fourth year of school. Consequently, the Italian Ministry of Education (MIUR) started to offer opportunities for professional

development to those non-language-subject teachers willing to be certified as CLIL teachers. In the last part of this chapter I will outline the initial training for the future CLIL teachers in Italy – DM n. 249/2010 – (MIUR, 2010). This Reform represents the final step in a long phase of experimentation and pilot projects that started about 20 years before.

However, today the Italian context has changed and in the meantime two national surveys have been conducted to investigate the Italian CLIL context. The first survey *L'Introduzione della metodologia CLIL nei Licei Linguistici* (MIUR, 2014 in Appendix 3) was promoted by the Ministry of Education. It is the first document that reports official data collected on a national scale and it focuses on three main aspects: the CLIL teacher profile, the types of CLIL implementation, and the implications for both students' and teachers' styles of learning and teaching. 480 teachers from 349 secondary language schools participated in this survey during their own first experience of official CLIL teaching in the third year of language schools in 2012-2013. Below some of the most significant data are reported.

a) The CLIL teacher's profile:

- 95% had a permanent contract.
- 73% were more than 46 years old.
- 48% had more than 20 years of teaching experience.
- 54% had certified language competence in the foreign language: C1(13%) and B2 (25%).
- 33% were attending the in-service CLIL methodological training.

b) Variables of CLIL implementation:

- 70% of CLIL experiences were taught in English.
- The average length of the CLIL modules for each teacher was 27 classes (50/ 60 mins each).
- The most common school subjects taught were *History* (32%), *Natural Science* (19%), *Physics* (13%), *Maths* (8%), and *Arts* (7%).

c) Implications for teachers and students:

- Both admitted some considerable influence on their styles of teaching and learning. The teachers agreed that their CLIL experience also affected their traditional teaching in their L1. Students were recognised to be more frequently involved in oral interaction than before in their classes that were driven by L1.

The second survey was published in 2016. The *Università Cattolica del Sacro Cuore* (Milan), with a mandate from MIUR, collected data from the CLIL teaching experiences of 873 teachers involved in 373 secondary language schools in the school year 2014-2015. The main findings of the *Azioni a supporto della metodologia CLIL nei Licei linguistici* (MIUR, 2016 in Appendix 3) are summarised below in accordance with the same three main focuses of the previous survey.

a) The CLIL teacher's profile:

- 95% had a permanent contract.
- 79% were more than 46 years old.
- 52% had more than 20 years of teaching experience
- 64% had certified language competence in the foreign language: C1 30% and B2 40%.
- 21.7% (249 out of 873 teachers) were attending the in-service CLIL methodological training.

b) Variables of CLIL implementation:

- 70% of CLIL experiences related to teaching in English.
- The number of CLIL lessons taught in a year was less than 50% of the total (72% of teachers); equal to 50% of the total: 16%; more than 50% of the total: 12%.
- The most common school subjects taught were *History* (32%), *Physics* (17.40%) *Natural Science* (17.40%), *Arts* (10.48%) and *Maths* (8.76%).

c) Implications for teachers and students:

- Both confirmed the positive effect CLIL had on their styles of teaching and learning.

As the two national surveys were conducted within a three-year period (2012-2015), the data collected did not diverge significantly. However, some interesting findings can be observed, especially concerning the content subjects taught in CLIL. *History* is always the first subject taught in 1/3 of the contexts. *Science* and *Physics* are the other most common CLIL subjects but with a considerable increase for Physics, which increased from 13% to 17.4%, whereas *Science* maintained more or less the same incidence (from 19% to 17.4%). Also, the number of CLIL experiences in *Arts* increased by almost 50% from 2012 to 2015 (from 7% to 10.48%). With regard to the teachers' profile, the most relevant finding concerns the improvement of their language competence in the foreign language. The percentage of teachers with certified B2 competence rose from 42% to 48% in 2012. Moreover, also teachers who have a certified C1 competence rose from 13 to 19% in 2014. In this new context, in which CLIL teaching is compulsory in secondary schools, constant monitoring of CLIL experiences in the whole country will be required and the findings will provide important elements of analysis for the various stakeholders involved in CLIL at different levels. In addition, the picture that emerges from the first two surveys is destined to change, especially in terms of the Italian CLIL teacher profile as more and more CLIL teachers are getting involved in the intense on-going official training programmes run by universities.

Hopefully, the next generation of Italian CLIL teachers will probably be younger and less experienced, but at the same time with higher language and CLIL methodological competence. This should also result in a higher CLIL awareness among teachers, and improvement of their CLIL procedures and practices, with obvious advantages for the students. From this it is evident that the universities in charge of the new CLIL teachers training courses have a huge responsibility.

With regard to the CLIL subjects involved, a further increase in scientific subjects is expected. Firstly, there is a stronger awareness among families of the important role that English plays in some job fields, especially if related to the world

of science, so they are prepared to invest more and more in this aspect of younger students' education. Secondly, albeit at risk of generalising, the new generation of Italian scientific subject teachers appears to be more familiar with a bilingual teaching context. They have already been taught in English at university, at least more than their colleagues in the humanities, and this should have a positive impact on their confidence with respect to CLIL teaching. However, some constraints imposed by the present system of the *Esami di Stato* at the end of the last year of secondary school will drive CLIL teachers to exclude some subjects from being taught in the foreign language.[3] It will be interesting to monitor how MIUR deals with the regulations concerning *Esami di Stato* and what solutions they will propose.

In addition, an emerging and interesting new CLIL scenario in Italy is given by the increasing number of schools that want to become "Cambridge International Schools". The advantage of studying school subjects in English is enriched by the possibility of certifying knowledge of their content by taking the final international examinations (IGCSE and AS-A Level), which are also potentially expendable for future studies abroad. The Cambridge International Examination (CIE) provides teachers with high quality material, resources and also professional development courses. The number of Italian schools that have taken this path as a solution for improving their CLIL offer has increased exponentially in the last two years. There are about 200 registered Cambridge International Schools to date, which are spread throughout the country. The most frequently studied subjects in these schools are Mathematics, Geography, Biology, Physics, History, and Art and Design.

The most innovative aspect of the 2010 Reform is related to the in-service professional training of CLIL teachers. I will summarise below the main legislative steps that have taken to the ongoing national programme:

- DM n. 249/2010: MIUR specified the features of the initial teacher training courses for acquiring the CLIL methodology (MIUR, 2010a).

[3] At the moment, for example, in the *Liceo Scientifico* Physics may be the compulsory subject for one of the two written papers in the final exams. The paper will be the same in all schools and it is likely to be Italian. Due to this restriction, it is likely that Physics teachers will not invest their energies in teaching subject content in a foreign language when their students will be tested in Italian in their final and most important exam.

- In December 2010, MIUR collected details of the teachers' availability and interest in attending specific language and methodological courses for acquiring the competencies to teach their subjects using CLIL methodology.
- DM 30 September 2011: MIUR established criteria and procedures for the implementation of the training courses for CLIL teachers. These courses are designed to build up both language and methodological competencies. Language courses are run by universities and are for those teachers who do not have a C1 (CEFR) certified level, which is the entry level for attending the CLIL methodological training courses which are also run by universities. In this transition stage a B2 level is also accepted in cases in which the teacher is also attending a language course for certifying a C1 level (MIUR, 2011).
- DD n. 6, 16 April 2012: MIUR defined the structure and content of the CLIL methodological courses reserved for in-service teachers, as well as the profile of the CLIL teacher (MIUR, 2012). The methodology courses are aimed at subject teachers and are designed to provide dual-focused training, both theoretical and practical. The first is conveyed through a series of core activities followed by more specific subject-related classes and workshops. The practical training comes in the final part of the course, in which the trainee teachers are directly involved in teaching practice, also in an action-research mode. A final discussion of their own work, in which they present a CLIL lesson or module, is mandatory to complete the training.
- DM n. 821, 11 October 2013: enables the language and CLIL methodological courses for about 10,000 teachers and secures the funding (MIUR, 2013).
- DM n. 351/2014, in 2014: provides the details of modalities, timing and costs of the CLIL methodological courses planned to start from January 2015 (MIUR, 2014).
- DM n. 435/2015 (art.23, comma a): MIUR confirms the funding of 1.8 million Euros for the training of in-service teachers involved in CLIL teaching in English. Moreover, a funding of 1.5 million Euros has been set aside for

those schools that will promote and put into practice CLIL projects (MIUR, 2015a).

- Nota 28710, 7 September 2015: provides instructions concerning the implementation of the language courses for B2 and C1 levels (MIUR, 2015b).

The length of the methodology courses varies from 20 CFU for in-service teachers to 60 CFU[4] for pre-service training.

In the light of this Reform, the role of teacher training becomes crucial. Considering the latest research at a national and international level, the Italian Ministry of Education, University and Research, in cooperation with ANSAS (the National Agency for the Development of School Autonomy) has planned learning paths on CLIL, focusing on both language and methodology. As far as language is concerned, the CEFR level of competence required to teach CLIL is C1. As for methodology, post-degree courses in CLIL are delivered by the universities. Although the learning paths are conceived as blended most of the activities are face-to-face. The structure of these courses is reported in Table 1 here below.

[4] 1 CFU corresponds to 25 hours of combined work/study. (20 CFU = 500 hours / 60 CFU = 1500 hours)

Table 1: Training course for CLIL teachers

Activities	Contents	Hours (including a taught course and individual work)
Basic training activities Lessons	Participants are initially taught a series of theoretical and methodological principles needed as prerequisites for the following part of the training.	225 hours
Specializing training activities Activities and delivery of specific subject-content through the foreign language are framed in a series of workshops and laboratories. They are aimed at a real, practical integration of the theoretical principles taught in the previous part of the course	Subjects-content teaching through a foreign language (CLIL approach)	225 hours
Other activities CLIL training at school through an action-research project and a final oral exam. Distance learning experiences are also possible.		50 hours

(Translated by the author. The Italian version in given in Appendix 2)

The descriptors related to the CLIL teacher competences defined by the Ministry of Education (Appendix 2) are very general and there are still divergences as to which key areas should be covered during the teachers' CLIL preparation. Marsh for example suggests that effective CLIL teacher training should deal with CLIL

fundamentals, personal reflection, content and language awareness, methodology and assessment, research and evaluation, learning resources and environment, classroom management, and CLIL management (Marsh et al., 2010). The expected profile of the Italian CLIL teacher is given in the same decree (n. 6 dated 16 April 2012) through a series of "is able to…." related to three different areas (Language, Content subject and Methodology) where the CLIL teacher is required to respond to specific needs (Appendix 2).

An English version of the original document published in Italian (available in Appendix 2) is reported below in Table 2 (Cinganotto, 2016):

Table 2: Italian CLIL teacher profile

Language dimension: **The teacher** • has a C1 level of competence in the foreign language (CEFR) • is able to manage, adapt and use subject materials in the foreign language • has a mastery of the specific subject language (specific lexicon, discourse types, text genres and forms) and of the subject concepts in the foreign language.
Subject dimension: **The teacher** • is able to use the subject knowledge according to the national curricula of the relevant school level • is able to teach the subject content integrating language and content.
Methodological dimension: **The teacher** • is able to plan CLIL paths in cooperation with language teachers and teachers of other subjects • is able to find, choose, adapt, create materials and resources to enhance the CLIL lesson also using ICT • is able to plan a CLIL path autonomously, using methodologies and strategies aimed at fostering the learning of content through the foreign language • is able to identify, create and use assessment tools which are consistent with CLIL methodology.

A clear definition of the CLIL teacher profile that can be widely accepted is given by Wolff (2012) where the focus is on the CLIL teachers' mastery of the language systems:

> The future content - subject and CLIL teacher will have to acquire a basic knowledge of how learners learn languages in a CLIL context. She needs to be acquainted with the developmental stages of learner language, with the main SLA theories, with the factors in influencing second language learning, and with the differences between first and second language learning.
>
> (Wolff, 2012:112)

Over the period 2010-2016, language and methodology courses have been activated twice. As regards the language courses, Universities first offered 50 B1-B2 and B2-C1 courses (37 English, 9 French, 2 Spanish, 2 German) *(*DM n. 249/2010*)* to a total of 1,250 teachers. Then, a further 218 courses for B1-B2 and B2-C1 to about 6,540 teachers were offered from 2015 (DM n. 435/2015 and DD n. 864/2015). Further details are not yet available. Concerning the CLIL methodological courses, Universities first offered 30 courses to about 900 teachers. Another 108 courses addressing about 3,000 teachers were given from 2015 (DM n. 821/2013, nota 17849 1 Dic. 2014). These numbers mean that nowadays in Italy there are nearly 8000 teachers with a certified B2-C1 language competence and about 4000 who have a either a certified CLIL methodological competence or a C1 language competence. Finally, although these numbers might appear reassuring, we should consider that nowadays in Italy we would need about 14.000 CLIL teachers to make the whole system fully operational. This means that after six years since the Reform (DPR n. 89/2010) less than one third of the estimated total of required CLIL teachers is available. In 2016, about 180 teachers from 6 Provinces in Lombardy completed their CLIL training programme at the *Università degli Studi di Milano* and are now certified CLIL teachers. The same University has activated another CLIL methodology course for in-service teachers of private schools.

Being aware of the weaknesses and delays in this first transition period, the Italian Ministry of Education has introduced some transitional arrangements through which they give some suggestions to the schools on how to implement CLIL in this earlier phase as summarized below.

- Collaboration between the FL teacher and the content teacher and/or even with the support of the native speaker teaching assistant.
- Starting from the third school year, limiting CLIL teaching to 50% of the annual hours for that specific subject.
- The 2 CFU of compulsory teaching practice scheduled within the CLIL methodology courses can be fully considered an official offer of CLIL teaching from the school so as to fulfil the requirements of the law.
- In the case of lack of non-language-teachers with the language and methodological competences required, cross-disciplinary projects through a foreign language are strongly recommended.
- Teachers are encouraged to share their best practices and experiences making the best possible use of technologies and innovative methodologies, especially among the schools belonging to the *Rete*, a regional school network started in 2013 aimed at promoting their CLIL collaborative activities.

In this chapter I have first traced the development of CLIL in Europe and in Italy providing an account of initiatives and decisions that have mostly affected the CLIL policy at macro and micro level. Both in Europe and in Italy strategies and policies for implementing CLIL as well as the actual CLIL teaching practices vary dramatically. CLIL is strongly environment-bound because its implementation depends on factors related to the social context, the specific linguistic situation, the possible autonomy of schools from the national curricula, and also on the CLIL teachers' education and the training (Marsh & Frigols-Martín, 2007). In Europe the training required for CLIL teachers is as multi-faceted as the ways in which CLIL is implemented. Nevertheless, some possible common frameworks for CLIL teacher-training have recently been suggested (Bertaux et al., 2009; EUCLID, 2011; Marsh et al., 2011).

Within the 28 European countries, Italy represents a breakthrough where CLIL is mandatory at least in the teaching of one subject in the last year of all secondary schools and from the third year in language-oriented schools. Meanwhile, the Ministry of Education has also designed official CLIL methodology and language training programmes addressed to all subject-content teachers willing to certify their competences in CLIL teaching. There is no doubt that this was a brave move and probably Italy was not well equipped when the idea of a mandatory CLIL was officially introduced in 2010. Indeed, in this initial phase the secondary school system is still suffering from these top-down decisions, particularly because of the need of properly trained CLIL teachers. It is merely the beginning of a phase that will take years and huge investments before each secondary school has an adequate number of CLIL teachers. Being a CLIL teacher means benefiting from many opportunities for re-thinking usual educational practices as well as to improve methodological performances. Hence the fundamental role of the universities' mandate to prepare the future generations of Italian CLIL teachers.

PART 2: THE STUDY

In the second part of my thesis, I will report on a classroom-based study conducted in three Italian upper secondary schools in Lombardy, a region in the north of Italy. The study was aimed at investigating to what extent Science teachers use Academic Language Functions (ALF) in their CLIL lessons. I will first introduce the research questions of my study. I will then describe the participants and the research methodology. In the last chapter, I will report and discuss the findings and highlight the main implications of my study for CLIL teacher education.

2.1 RESEARCH QUESTIONS

Academic language is "the language that is used by teachers and students for the purpose of acquiring new knowledge and skills […] imparting new information, describing abstract ideas, and developing students' conceptual understandings" (Chamot & O'Malley, 1990:40). When studying Science, students need to achieve a "genre knowledge" that is the awareness of the characteristics and properties of the Science text genre. In this field, learners come into contact with three basic text types that Llinares, Morton and Whittaker (2012:112) identify as follows:

a) texts which instruct them how to carry out the steps of an experiment or report how it was done; known as *procedure*;
b) texts which organise scientific knowledge: *reports*;
c) texts which explain scientific processes: *explanations*.

To achieve each of these activities, specific language is required. "It is undeniable that in many cases specialized vocabulary is the access key to specialized discourse in any given disciplinary or professional field, and plays a crucial role in all forms of production and reception of texts pertaining to specialist subjects" (Garzone, 2006:13). Nevertheless, academic language is more than specific, subject-content vocabulary words related to particular topics. Rather, academic language represents the entire range of (classroom) language used in an academic context, including upper-secondary schools and CLIL classrooms are academic environments, and academic language will, perforce, be used. As Dalton-Puffer (2007:127) points out, "[…] depending on

how effective the ALF is in that specific discourse, it will be regarded as typical or even constitutive of a particular situation of language use or not". It is within this context that I decided to focus my study on the ALF as a relevant aspect to be investigated.

Empirical studies on the use of ALF in a CLIL environment are scarce in Europe at present (cfr. 1.1.2). The only notable studies are those represented by the studies conducted in Austrian lower- and upper-secondary schools (Dalton-Puffer, 2007; Lackner, 2012; Kross, 2014) and in Spanish higher education (Martin Del Pozzo, 2015). Moreover, to the best of my knowledge, no classroom-based studies on ALFs in Italy's CLIL classrooms have ever been documented. The aim of this classroom-based study is also to contribute to the development of this field of research in the Italian context and investigate how ALFs are used in CLIL upper-secondary school classrooms. In particular, the study is an attempt to investigate whether the teaching of scientific school subjects in English fosters the teacher's use of ALFs. My investigation focused on the use of the micro function of "hypothesising". There are two main reasons for this choice. Firstly, positing hypotheses is the mainstay of scientific school subjects such as Science, Physics and Mathematics. Secondly, as Dalton-Puffer (2007:159) stated:

> Hypothesising appears at the core of the ALF; […] it requires the use of relatively complex verb phrasing for its verbalisation so that it is an interesting testing ground for the occurrence of more "difficult grammar" in the classroom language.

The complexity of the "grammar" inherent in the construction of a hypothesis is also highlighted by Murcia and Larsen Freeman (1999:545) who stated:

> Conditional sentences consist of two clauses, a subordinate clause and a main clause, and are therefore more complex syntactically than many other structures. Moreover, the semantics of all the various types of conditional clauses are subtle and hard to understand even

> for native speakers. […] Students need a good grasp of the English tense-aspect system as well as the modal auxiliaries and negation before they can cope with the full range of conditional sentences in English.

The complexity of any attempt to define "conditionals" has also been pointed out by Declerck and Reed (2001: 4-7):

> What we should be looking for is not a typology but a number of typologies. […] The number of criteria that can be used to categorize conditionals and the number of ensuing types and subtypes is so large that we found it impossible to identify a genuine common denominator.

CLIL teachers are expected to be aware of the specific characteristics of the language required to teach their academic discipline (Llinares, 2015) and a good command of ALF is fundamental to the process of constructing learners' knowledge.

This study, aimed to address the following research questions:

1. How much hypothesising is there in scientific-subject CLIL lessons?
2. How is the function of hypothesising used by CLIL teachers?

For each overarching question, I considered a series of correlated questions:

1a) Which CLIL subjects foster the use of hypotheses?
1b) Which linguistic forms are used to make hypotheses?
1c) In which teaching activities does hypothesising occur most?

2a) How is hypothesising linguistically realized across different subjects?
2b) How does hypothesising occur within the lesson?

2.2 METHOD

In this section, I will illustrate the research methodology for my study. I will first provide a description of the three schools selected and the participants involved. I will then describe the instruments for data collection and the process of data analysis.

2.2.1 Context and Participants

After a long period of both local initiatives and pilot projects on a national scale covering the past 10 years (cfr. 1.3), CLIL-related foreign language policy in the Italian context has taken a decisive step forward in the light of the 2010 school Reform (DPR nn. 88,89/2010) (cfr. 1.3). I decided to investigate the main features of this new, emerging CLIL scenario. The schools and teachers to be involved in this study were therefore selected to fulfil two specific requirements:

1) schools offering language-oriented courses (*Licei Linguistici*).
2) CLIL teachers with a certified C1 level (CEFR) in English and a CLIL teaching certificate awarded at the end of the official CLIL methodology courses run by the Ministry for Education (cfr. 1.3).

I decided to include these types of schools because *Licei Linguistici* (Linguistically-oriented upper-secondary schools) have been running CLIL courses officially since 2013 and thus have a longer experience of offering CLIL than other types of schools. The second criterion was justified by the fact that the CLIL teachers selected would match the official profile defined by the Ministry for Education (cfr. 1.3) Finally, it is worth pointing out that in this study CLIL denotes an educational context in which a non-native-speaker teacher of scientific subjects teaches the subject content in English mainly through monolingual methodologies. Consequently, the use of an interactive methodology is extremely reduced.

Schools

The three secondary schools involved in the study (hereafter A, B and C) are located in Milan, where the number of schools implementing CLIL has been increasing significantly over the past three years. This is due to the supportive activity of the Regional Office for Education (USR), which boasts a long tradition of promotion and promulgation of CLIL methodology and practices. Several CLIL-related educational initiatives and projects at various levels, from primary schools to teacher training, have also been carried out by regional and independent stakeholders since the early 1990s. This fertile soil has favoured a constant spread of CLIL practices in this part of Italy. A summary of the information about Schools A – B – C is provided in Table 3.

Table 3: The schools

	SCHOOL A	**SCHOOL B**	**SCHOOL C**
Type	State	State	State
Location	City centre	Residential area	Outskirts
Courses	*Liceo Linguistico* and others	*Liceo Linguistico* and others	*Liceo Linguistico* and others
No. of students	1800	1800	820
Founded in	1906	1934	1977
CLIL courses	History in German from the 4th year	No	No
Foreign languages taught	English, French, Spanish, German	English, French, Spanish, German	English, French, Spanish, German
CLIL classes	Regularly held from the 3rd year	Occasional	Occasional

School A is an upper secondary state school located in a central area of the city. With about 1,800 students and a more than one hundred-year history, it has a good reputation across the city. Its *Liceo Linguistico* branch provides four foreign languages

— English, French, Spanish and German — and the students have to study three of them from the first year, as required by the National Curriculum. Since 2012, CLIL in English has been implemented regularly from the third year in Science (Chemistry, Biology and Earth Science). From the fourth year on, some CLIL modules for History in German have also been taught.

School B is an upper secondary state school located in a wealthy residential area of Milan. With its 1,800 students, it has a tradition of eighty years and enjoys immense popularity in Milan. Students can choose *Liceo Linguistico* from a total of five types of courses. It offers three foreign languages. English is compulsory, whereas two other foreign languages can be selected from an option of French, Spanish and German. During my observation period this school did not offer a regular CLIL course in any subject. CLIL is provided only when the school can rely on the availability of CLIL teachers.

School C is the third upper secondary state school involved in my study observation. It is located on the outskirts of Milan. It has about 820 students and has been in existence in the area for roughly 50 years. It offers two courses, the *Liceo Linguistico* (a linguistically oriented course of studies) and *Istituto Tecnico* a technically oriented course of studies). The former offers three foreign languages. English is compulsory, whereas the other two foreign languages can be chosen among French, Spanish and German. This school does not offer regular CLIL implementation, except for the teaching of Physics by one teacher (Table 3). Every year their CLIL offer depends on the availability of CLIL teachers in the school. At the time of my observation period, no teachers were involved in CLIL teaching other than T3.

To sum up, the three schools involved have similar profiles. They all are state, public-funded schools and this means they do not rely on additional private funding to implement their teaching offer and education programmes. In addition, teachers in charge of CLIL classes do not receive any financial support for the extra planning time that CLIL teaching usually requires. Finally, the three schools offer the same foreign languages, namely English, French, Spanish and German. School A is the only one that employs a number of full-time CLIL teachers and is thus able to guarantee constant and regular CLIL teaching in the classes of the last three years. The three schools cover a variety of scientific subjects relevant for my research.

Although the schools shared similar features in terms of location, size and the range of foreign languages taught, their orientation towards CLIL varied. Table 4 illustrates the type of implementation of CLIL teaching in the schools involved in the study.

Table 4: CLIL implementation

	Subjects	**Year** [5]	**Number of lessons in a school year** (each lesson lasts 50-60 minutes)		
			Non - CLIL	**CLIL**	**EFL**
School A	Biology	Year 4th	66	33	99
	Chemistry	Year 3rd	66	33	99
	Earth Science	Year 5th	66	33	99
School B	Physics	Year 3rd	66	5	99
		Year 4th	66	4	99
School C	Maths	Year 4th	66	9	99

Indeed, while School A has been implementing CLIL for a few years and managed to fulfil the Reform requirements, School B has a more recent experience of CLIL teaching with just a teacher (T2) able to cover 100% of her Physics lessons in English. In School C implementation has not been enhanced because of disagreements among the teachers and their general sceptical attitude towards CLIL. It is not by accident that even the only CLIL Teacher (T3) talking about the benefits of CLIL

[5] years 3rd - 4th - 5th correspond to the last 3 years of upper secondary school. Students usually are 16-18 years old.

commented: “I don’t know if it is worth the hassle. We know we are required to do it but at the moment we try to limit the damage”. Not exactly what Kiely (2011:157) calls for – i.e. that the teacher should be a strong believer in CLIL in order to contribute positively to its success.

The CLIL subjects provided in the three schools are taught for two lessons a week. Scientific subjects cover a small part of the curriculum. However, only T1 has managed to implement CLIL for up to 50% of the total teaching time in a school year. T2 taught nine CLIL Physics lessons but for two different classes and T3 planned only nine CLIL lessons of Maths. Thus, T2 and T3 limited their CLIL lessons to less than 15% of their total teaching time. Only one class in School A was exposed to additional CLIL teaching of History in German. This means that the majority of learners still had limited CLIL learning experiences.

Learners

I will now provide a profile of the learners involved in each school, which is summarized in Table 5.

Table 5: The learners

	Year	**Average no. of Students in each class**	**CLIL subject**
School A	4th	15	Biology
	3rd	20	Chemistry
	5th	17	Earth Science
School B	3rd	21	Physics
	4th	19	
School C	5th	16	Mathematics

At the time of my classroom observation, all the students were attending their last three years of schooling (16-19 years old). Altogether, a total of 120 students in five different groups or classes were involved in the study. The size of the classes ranged between 15-21 students, which was slightly smaller than the average in Italy. The students are from a variety of social backgrounds. Gender distribution was equal in schools B and C, whereas in school A there was a significant majority of female students. Only five students out of 120 were non-native speakers of Italian. In Schools A and C two foreign exchange students were also attending the lessons. Students attending the *Liceo Linguistico* have four English FL classes (50-60 minutes each) per week, including one lesson with a native speaker teacher with the objective of improving their oral interaction. This is commonly called a "conversation" class. Thus, the students who have attended English FL classes since the elementary school were exposed to the target language for about 120 hours per year in the first two years of the upper secondary school, and about 90 hours per year in the last three years of schooling. Only a very few students have a certified B2 level. The three schools did not have any policies regarding FL certification and everything was left to the initiative of the teachers.

Teachers

I will now introduce the profile of the three CLIL teachers who participated in the study (Table 6).

Table 6: The CLIL teachers

School	Teacher	CLIL subject/s
School A	**T1**	Biology Chemistry Earth Science
School B	**T2**	Physics
School C	**T3**	Mathematics

As mentioned, these CLIL teachers are representative of the population of the 'new generation' of Italian CLIL-trained teachers and satisfy the formal requirements for teaching CLIL lessons (cfr. 1.3). They successfully completed a CLIL methodology course (run by the *Università degli Studi di Milano*). They have a C1 English certificate and a good evaluation report for their attendance of the methodology course.

The teachers are native Italian speakers. T1 and T3 are in their fifties, while T2 is older. They all have at least twenty years of teaching experience. T1 was a researcher abroad and T3 was also vice-principal of her school. As with most teachers in the Italian upper secondary schools, they are qualified to teach various subjects in the same areas. Indeed, both T2 and T3 teach Physics and Mathematics, while T1 (the Science teacher) teaches several scientific subjects, such as Biology, Chemistry, Earth Science, Astronomy and Biotechnology, depending on the grade and class she is teaching. With regard to their English-language competence, they have learned English by various means and by attending courses and taking part in exchange programmes. T2 has even attained a C2 level.

During the interviews I conducted with the participants, I also investigated their motivations as CLIL teachers and their personal beliefs about the benefits of CLIL in term of language and subject learning. T1 and T2 said that their passion for languages has encouraged them to embark on this new professional experience, whereas T3 said

that a more general curiosity was her reason for setting out on this path. With regard to the language benefits for students, the three teachers believed that CLIL primarily enhanced their students' knowledge of vocabulary. However, T1 specified that the specialised English lexis for her subjects was not that demanding due to the similarity between English and Italian Science vocabulary. In addition, T1 was the only one who thought that the improvement in her students' fluency was the greatest benefit derived from CLIL learning. Her main objective is to make students comfortable with the use of English through CLIL. In particular, she said that "Italian teenagers know the grammar very well but then, when they are expected to speak, they're pathetic […]" referring to their poor ability to communicate. On the other hand, T3 emphasised that she did not expect her students to produce something in English.

2.2.2 Data Collection

The following instruments were used for the data collection of the study:

- pre-observation and post-observation teacher interviews
- classroom observation
- audio recording of CLIL lessons

A preliminary interview was conducted with each teacher, T1, T2 and T3, separately. I introduced the interviews by providing the teachers with some details about my research project and aims. I collected some preliminary information about their schools and we arranged the schedule for my class observation. The interview was semi-structured. I did not have a set of identical questions to ask but just an outline for the interview, which was adapted according to their responses. Each interview was aimed at collecting the same type of data though so that the findings would be comparable. Each interview addressed the following topics:

- motivation for becoming CLIL teachers
- belief in CLIL as a language learning opportunity

- overall awareness of the English language
- awareness of the way academic language functions are used.

Classroom observation took place from March to December 2015, between the second term (February-June) of the school year 2013-2014 and the first term (September-January) of the school year 2014-2015. A total of 45 lessons were observed. My observation was set up after obtaining the students' and teachers' consent for audio recording. (Appendix 5). As each lesson lasted 50 to 60 minutes, depending on the weekly schedule of each school and class, the amount of video recorded data varied according to the different subjects. The average teaching time per lesson was in fact 49 minutes.

Each CLIL lesson was audio recorded. Because of some insuperable practical constraints, I excluded the possibility of videorecording the lessons. Although the equipment I used was always visible to students and teachers, they were not affected by it. In addition, I always sat in a position where I would be the least intrusive as possible. As Italian teachers tend not to move around while teaching, but mostly prefer to stand in front of the students, I placed my semi-professional recorder (a Sony IC Recorder ICD – PX333) on the teacher's desk so that it would be as close as possible to the teacher. Although the recorder did not pick up the voices of the students who were sitting in the back rows, the teachers' words were recorded perfectly. This was adequate, because it was the teachers' performance that I intended to investigate. Indeed, the inaudible material represents a very low percentage of my corpus. I noticed, in fact, that all the lessons conformed mainly to a teacher-centred model. Only under certain conditions did T1 set up pairwork. Consequently, according to the traditional Italian teaching style, most of the classroom discourse was occupied by teacher talk.

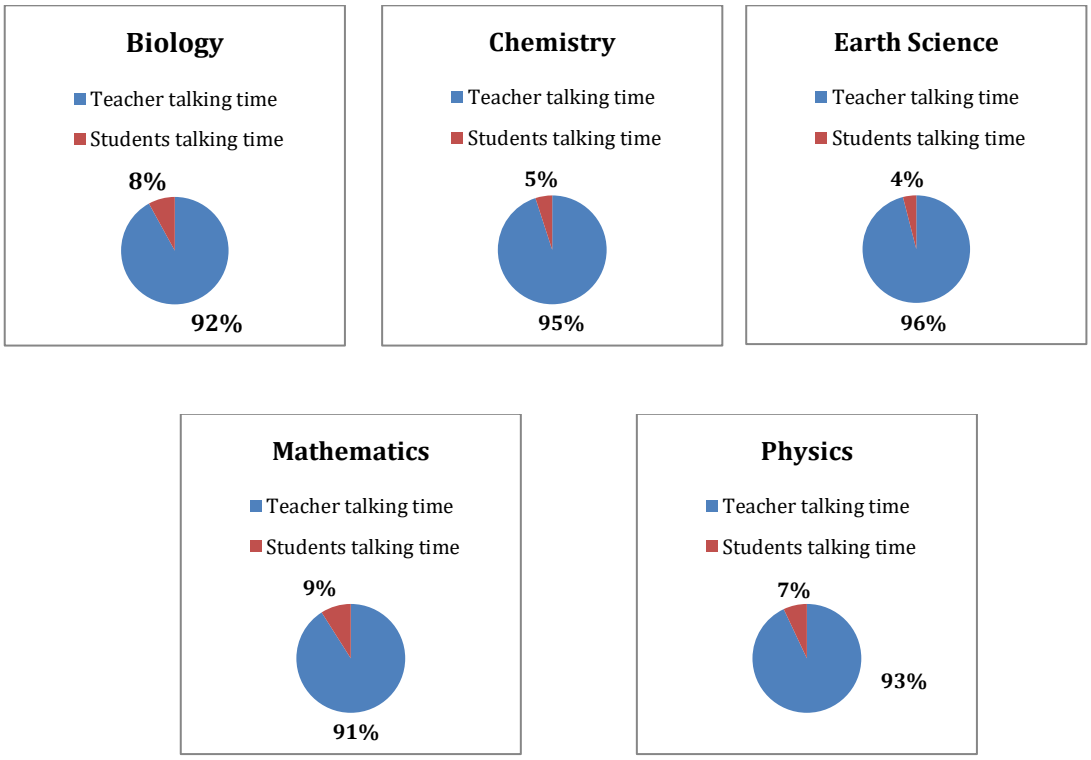
The final body of the data collected consisted of 37 hours and 16 minutes of classroom audio-recordings, which were then transcribed (Table 7).

Table 7: Classroom observational data

Subject	Period of data collection	no. of lessons recorded	Total time of recording	Average time per lesson
Biology	April-June 2015	9	6 hours 53 minutes	46 minutes
Chemistry	Oct-Dec 2015	9	6 hours 58 minutes	46 minutes
Earth Science	Oct-Dec 2015	9	7 hours 14 minutes	48 minutes
Mathematics	Nov-Dec 2015	9	7 hours 49 minutes	52 minutes
Physics	March 2015	9	8 hours 22 minutes	56 minutes
Total	-	45	37 hours 16 minutes	-

As illustrated (Figure 2), the percentage of teachers' and students' talking time was far from being balanced. Teachers always spoke for more than 90% of the time.

Figure 2: Distribution of teacher and student talking time



These data confirm that "CLIL classrooms can be very teacher-centred places" (Bonnet, 2012:68) and an educational environment with an average of 20 students in which some 95% of talking time is by one person (the teacher) clearly reveals some inherent weaknesses of the way CLIL methodology is implemented in the context I observed.

During the phase of classroom observation, I supplemented the audio recording with the use of an observation grid, which I filled in regularly in order to make notes about aspects that might not be evident from the audio material. The observation grids turned out to be very useful during the transcription and coding phase because the notes helped me retrieve information about what was happening at that very moment of the lesson. An example of observational notes is provided below.

Figure 3: Example of observational notes

Class	4H
Subject	Biology
Date	16-04-2015
N° Students	12

Time (Phase)	Discourse	Notes
8:12 (Teacher recaps the main contents of the previous lesson)	T: *Can you recap what we said yesterday?* S1: *The digestive system .* T*: ok, we talked about the digestive system and we talked about the...And what is S2? Which organs of the digestive system?* S2: *The higher part from the mouth to the stomach.* T: *from the mouth to the stomach, we stopped to the cardias. What is cardias S3?* S3: "*Allora" ...*	Students are quiet and collaborative T. shows some slides used in the previous class T. reads out from the slides "Organs of digestion

2.2.3 Corpus Description

Before detailing the phases of my research, I will introduce the features of the corpus on which I based my data analysis. The corpus consists of the transcription of the classroom discourse of 45 lessons of Biology, Chemistry, Earth Science, Maths, or Physics lessons. Although I also transcribed the students' discourse, I did not consider these data for my analysis as my main focus here is on the CLIL teacher's spoken discourse. However, the learners' speech was extremely helpful in recreating the context in which the teachers formulated their hypotheses. Classroom data were transcribed using the free version of the software *Express Scribe*; for the transcription conventions I adapted a model proposed by Mackey and Gass (2005:345) opting for a broad transcription, as shown in the extract below (Figure 4):

Figure 4: Sample of a transcription of CLIL teacher discourse

Biology, 28 May 2015

(Playing a video)

T1: *ok, so this is a graph and what do you have here on the y – x, what do you think you have on the y-x?*

S2: *the polarization*?

T1: *so the voltage. You can see polarization and depolarization because here you have the voltage, here is the minus and here is the plus. And what do you have on the "x" axes*?

(Playing a video)

T1: *ok, so here you have the SA node, here you have the AV node and then is in the septum that divides the right part and the left part of the heart and then you have the bundle fibres that is called bundle of* […]

The students are numbered according to the order in which they speak (S1, S2, S3…). In the Table 8 I summarize the main features of my corpus.

Table 8: Corpus description

Subject	Number of words	Total recording time
Biology	23,100	7 hours 14 minutes
Chemistry	19,837	6 hours 53 minutes
Earth Science	16,407	6 hours 58 minutes
Mathematics	21,501	7 hours 49 minutes
Physics	18,164	8 hours 22 minutes
Total	99,009	37 hours 16 minutes

The size of the corpus ranges between 16,407 words in Earth Science and 23,100 words in Biology with a difference of about 30%, which, however, did not affect the number of occurrences of hypotheses analysed for this study.

2.2.4 Data Analysis

In this section I will present the methodology used for data analysis in my research. On account of the two main research questions to be answered, that is *how much hypothesising there is in a scientific-subject CLIL lesson* and *how the academic function of hypothesising is used by CLIL teachers*, I carried out a quantitative and qualitative analysis of my data, respectively.

The data analysis first involved investigating quantitatively the realization of hypotheses in the CLIL teachers' spoken discourse. This analysis focused on four main issues:

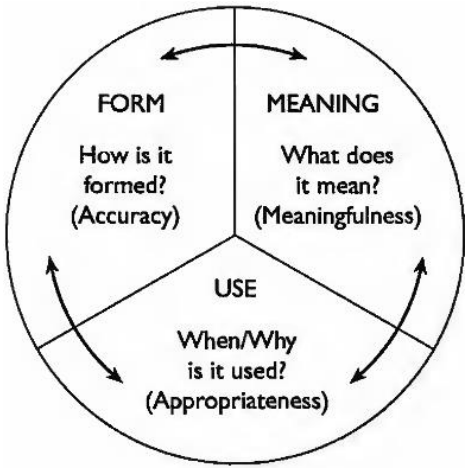
a) the total number of hypotheses in the corpus;
b) the number of hypotheses realized in each subject lesson. The hypotheses realized by each teacher were quantified, too. This latter step was justified by the fact that, whilst T2 and T3 taught one subject each (respectively Physics and Mathematics), T1 participated in this study as a CLIL teacher of Biology, Chemistry, and Earth Science.
c) how often specific linguistic forms were used to hypothesise;
d) at which stage of the lesson (previously categorized) hypotheses occurred

most.

The phase of transcribing the audio recordings of both lessons and interviews was followed by the coding of the data. After tagging every occurrence of "if", I worked directly on the transcripts and highlighted every occurrence. I counted the total number of hypotheses posited across the five subjects, and of course in the individual subject. I regularly filled in a table with the data I collected, computing the occurrences of 'if'. The same data were also drawn upon to quantify the hypotheses produced by individual teachers.

The next step of quantitative analysis consisted in investigating the range of linguistic forms exploited by the CLIL teachers for producing hypotheses. Thus, to categorize my data I needed to apply a framework of analysis. I soon realized the vast range, both semantically and syntactically, of the language used for generating conditionals and how many different parameters needed to be taken into account. In order to gain an insight into conditionals I referred to Declerck and Reed's (2001) empirical analysis. I then chose the framework proposed by Celce-Murcia and Larsen-Freeman (1999) in their pedagogical grammar. Compared to some traditional analyses of English grammar, they intend to view grammar "with a communicative end in mind. […] Grammatical structures do not only have a morphosyntactic form. They are also used to express meaning (semantics) in context-appropriate use (pragmatics). […] The three are interrelated – that is, a change in one will involve a change in another (1999:4). Moreover, this grammar is addressed to (ESL/EFL) teachers and I concluded that it worked well for the aims of my analysis. The research by Dalton-Puffer (2007), which opened up the studies on academic language functions in CLIL contexts, was also useful for the type of categories she employed.

Figure 5: The three dimensional framework (Celce-Murcia and Larsen-Freeman, 1999:4)



Below I report the most pertinent categories I have considered as far as conditionals are concerned. The examples and the brief introductions to the tables provided below are from Ford and Thompson (1986), Celce-Murcia and Larsen-Freeman (1999:543-565), and Declerck and Reed (2001).

A conditional sentence is a complex sentence that consists of a main clause that gives the result or outcome, and a subordinate clause that sets the condition. The latter typically begins with the subordinator "if" but, in most cases, two clause orderings are possible. Furthermore, in hypothetical conditionals with initial "if clause" containing certain auxiliary verbs as "had" or "should", it is possible to delete the initial "if". However, when such a deletion takes place, subject/operator inversion must follow. Finally, the entire conditional clause following "if" can be replaced by certain pro-forms: "so" is used if the clause is affirmative; "not" is used if the clause is negative.

Table 9: Forms of Conditionals

***If* position** *If I go, George will go / George will go if I go.*
Subject inversion *Had I known that, I wouldn't have said anything.* *Should someone ring, tell them I'll be at the office till six.*
Conditional clause / Pro-forms *Would you like to make a classroom presentation? (If so, volunteer. If not, you don't have to)*

English conditional sentences express three different kinds of semantic relationships: factual conditional relationships (generic, habitual, implicit inference, and explicit inference), future conditional relationships, and imaginative conditional relationships (hypothetical and counterfactual).

Table 10 The meaning of Conditionals

FACTUAL (Timeless)	**Generic** *If oil is mixed with water, it floats.*	
	Habitual *If I wash the dishes, Sally dries them.* *If I go into town, I take the bus.*	
FACTUAL (Time-bound)	**Implicit inference** *If smog can be licked in L.A., it can be licked anywhere.* *I can lend you a couple of quid, if that'll help.*	
	Explicit inference *If someone's at the door, it must be Peter.*	
FUTURE	**Strong condition and results** *If you don't do your homework, you will fail the exam.*	
	Degrees of weakened condition of results *If Steve comes to the class, he should get the answer to the quiz.*	
IMAGINATIVE	**Hypothetical Present** *In your place I wouldn't react if he wrote me a threatening letter*	
	Hypothetical Future *If Joe were to have the time, he would go to Mexico*	
	Counterfactual Present *If my grandfather were alive today, he would experience a very different world.*	
	Counterfactual Past *If she had been honest, she would have told us about it.*	
SOME OTHER MEANING DISTINCTIONS	**Related connectors** only if; unless; even though; even if; whether…or not; (so that if); (because if); (then if); (but if); (it is as if)	*I will stay home <u>only if</u> it rains.* *Don't apply for the job <u>unless</u> you have an M.A.* *You should visit Vienna <u>even though</u> it is expensive.* *I wouldn't marry you <u>even if</u> you were the last person on earth.* *I will stay home <u>whether</u> Professor Dickinson agrees to give the graduate students a lecture on plasma physics or not.*
	Related verbs **hope; wish;** (guess); **(let's)imagine**; (suggest); (let's) **suppose**	*I <u>hope</u> (that) John will come.* *I <u>wish</u> I were a millionaire.* *<u>Let's imagine</u> that we had a new president.* *<u>Suppose</u> we went to Europe next summer. How much would it cost?*
	Modals (can); (could); should; (must); may	*If Steve comes to class, he <u>should</u> get the answer to the quiz.* *If you finish your vegetables, I <u>may</u> buy you an ice cream cone*

Elements in brackets are not included in the framework I originally referred to but since the teachers used them I decided to include them here even if not supported by an example taken from an academic corpus.

According to Ford and Thompson (1986) who carried out a corpus analysis of conditionals in English, conditional sentences with “initial if” clause accounts for almost 80 percent of conditional sentences. They perform four functions in both oral and written discourse (in order of frequency): proposing options for future scenarios; introducing contrasts; providing examples following generalizations; making inferences based on previously mentioned assumptions. Moreover, sentence “initial if” clauses have several predominantly oral discourse functions: giving polite directives, and speaking humorously or sarcastically. As far as the use of sentence “final if” clause is concerned, only 18 percent of the “if” clause in Ford and Thompson’s (1986) oral corpus were in final position. They found that most of their sentence “final if” clauses were accounted: within a nominalization, an infinitive, or a relative clause; when strong arguments are introduced in the main clause; when long and involving conditionals occur. Sometimes final oral “if” clause are used deferentially, and follow an evaluation emphasised in the initial clause. Finally, from their corpus, 19 percent of final conditional clauses occur with questions.

Table 11: The use of Conditionals

INITIAL ***if* clause**	**Proposing options for future scenarios** *I'll probably be there at your place, at the latest midnight.* *Okay, well, If I go to bed, I'm gonna leave the door open.*
	Introducing contrasts *…But if you thought that A was yourself, B your hated rival, and C the schoolmaster who set the problem, your calculations would go askew* […]
	Providing examples following generalizations *Any solution… acid, base or salt… will act chemically more readily […]* *For example, if electrodes are placed […]*
	Making inferences based on previously mentioned assumptions *Joyce went there last night.* *Well, if Joyce went there, she saw what happened.*
	Giving polite directives [tour guide to the people on her bus] *If you look out the left side, you'll see Mann's Chinese theatre.*
	Speaking humorously or sarcastically *If he's intelligent, I'm Albert Einstein.*
FINAL ***if* clause**	**Within a nominalization, an infinitive, or a relative clause** *Imagine the difficulty of understanding this information if it were presented one word at a time.*
	When strong arguments are introduced in the main clause *The Soviet government would have been less fierce if it had met with less hostility in its first years.*
	Within long and involving conditional clauses
	Deferential use *Let's do the dishes later, if that's okay with you.*
	Follow an evaluation the speaker presents first for emphasis *I think it would be better if you came after all*
	With questions *Well, why doesn't he say something, if he has a solution?*

Data analysis involved first of all the counting of occurrences of conditional sentences used to make hypotheses in the whole corpus. I then calculated their percentage according to the subject in which they were used by each school teacher. Celce-Murcia and Larsen-Freeman (1999:557) report the frequency of conditional sentence types accounted in Hwang's corpora (Table 12). Hwang analysed a corpus of English speech (63,746 words) and writing (357,249 words) representing diverse discourse types and found that seven patterns, out of a total of about 70 patterns that naturally occurred, accounted for two-thirds of the conditional sentences in her spoken and written corpora. The frequency ranking for Hwang's (1979) corpora is shown below in Table 12.

Table 12 Hwang's (1979) Frequency Ranking of Conditionals (in spoken corpora)

Structure	**Type**	**Speech (266 conditionals)**
If + pres., pres.	Generic factual	51 (19.2%)
If + pres., {will/be going to}	Future (predictive)	29 (10.9%)
If + past, {would/ might/could}	Present hypothetical or counterfactual	27 (10.2%)
If + pres., {should/ must/can/may}	Explicit inference factual or future with weakened result	24 (9%)
If + {were/were to}, {would/could/might}	Present or future hypothetical or present counterfactual	23 (8.6%)
If + {had + *-en*/have + *-en*}, {would/could/ might} + have + *-en*	Past counterfactual	10 (3.8%)
If + pres., {would/ could/might}	Future with weakened result	7 (2.6%)
If + past, {would/ could/might} + have + *-en*	Past counterfactual	less than 2%

As far as the spoken corpora is concerned, the so called (generic) *factual conditional* ranked as the most frequent, whereas the *imaginative hypothetical* (past) was the least used. More importantly, Hwang's and Celce-Murcia and Larsen-Freeman's studies indirectly help to establish more realistic priorities for the English Foreign Language (EFL) teacher and the CLIL teacher, too.

The last step was aimed at quantifying how many types of conditionals were used during specific teaching activities. I therefore identified four communicative activities, namely:

1. *Providing new input* (introducing a new topic; describing or explaining a process; giving definitions; introducing new vocabulary; etc. …)
2. *Giving instructions and directives* (in order to support students while doing an exercise; while reading out a graph or a chart; the instructions are included in the task; ect. …)
3. *Providing examples*
4. *Asking students questions*

The qualitative analysis was aimed at addressing the second research question of my study, that is how the academic function of hypothesising was used by the CLIL teachers observed. I focused on two main issues. First I investigated how specific lexicogrammatical features of conditionals were used across the subjects taught in the different CLIL classes. Second, I took into account the four teaching activities described above, and investigated how hypothesising occurred in each of them. Qualitative data are supported by a selection of extracts that exemplify particular features of the CLIL teacher's spoken discourse.

Descriptive statistics (e.g. percentages, graphs, charts etc.) were used to support the presentation and analysis of both quantitative and qualitative data (cfr. 2.3).

2.3 FINDINGS AND DISCUSSION

The main aim of this study was to determine to what extent the academic language function (ALF) of hypothesising is embodied in the CLIL teacher's discourse related to the five scientific-school subjects investigated: Biology, Chemistry, Earth Science, Maths, and Physics. In my analysis I will refer to the conditional sentence types in English as categorized in 2.2.4. Data will be analysed using quantitative and qualitative methods. The findings will be presented according to the research questions illustrated in section 2.1.

2.3.1 Quantitative Analysis

The findings I will report on in this section will answer the first research question of my study, i.e. how much hypothesising there is in a scientific-subject CLIL lesson. If on the one hand the five subjects investigated may share a wide variety of basic concepts and theories due to their science-related nature, on the other hand they of course differ in some of their fundamental principles and also in their own specific terminology (Vollmer, 2010). Of course, all the ALFs play an important role in characterizing academic discourse in the subject area as they are the linguistic representations of the cognitive processes necessary to acquire a good scientific literacy. Given that the investigation of ALFs in CLIL discourse is still in the early stages and the lack of similar empirical studies on ALFs in the CLIL classrooms in Italy, my findings are not easily comparable. To my knowledge, only two studies have investigated the use of the ALF of hypothesising so far (Dalton-Puffer, 2007; Martìn Del Pozzo, 2015). I will first present the quantitative data concerning the occurrences of conditional sentences verbalized by the CLIL teachers in the whole corpus and the average of occurrences according to the number of lessons.

Table 13: Distribution of conditional sentences verbalized during the CLIL lessons

Teacher	Subject	Total number of conditional sentences in the corpus	Average number of conditional sentences per number of CLIL lesson
T1	Biology	83	9
	Chemistry	148	16
	Earth Science	90	10
T2	Physics	102	11
T3	Mathematics	108	12
		531	12

These data show that Chemistry is the scientific-school subject that most encourages making hypotheses, with a total of 148 realizations, whereas Biology is the one with the least – 'only' 83 hypotheses in 9 lessons, i.e. a difference of about 45%. Data related to the three other scientific subjects (Earth Science, Maths, and Physics) are similar. According to these quantitative data, it goes without saying that the CLIL Chemistry teacher is the one who realized more hypotheses than the other teachers. In fact, unlike T2 and T3, who only taught one subject each, the CLIL Chemistry teacher (T1) also taught Biology and Earth Science. It is surprising to notice that while involved in teaching these subjects, T1 employed a below-average number of hypotheses, precisely 9 in Biology and 10 in Earth Science and, in any case, far fewer than those occurring in Chemistry.

Vollmer (2010:25) states that an ALF is the interface between cognition and verbalization, thus if the ALF of hypothesising is verbalized more in one subject than in another, consequently it may be assumed that CLIL teachers activate the cognitive process of making a hypothesis with differing frequency. However, the micro-function

of making a hypothesis is likely to be a primary competence in the process of meaning making in a scientific learning environment, as relevant as classifying, identifying, and sequencing, amongst the others.

Moreover, as regards the distribution of the conditional sentences used for making hypotheses, Table 11 shows that they occurred regularly in every lesson in all five subjects. However, some lessons produced a very limited number of hypotheses whereas it is evident that in some others the CLIL teachers formulated many more.

Table 14: Distribution of hypothesis making

Subject	**CLIL lessons**								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Biology	4	6	8	11	13	5	16	9	12
Chemistry	22	21	8	15	18	5	28	14	17
Earth Science	9	16	7	3	10	14	10	10	11
Maths	16	7	17	3	10	19	10	14	12
Physics	12	12	18	7	3	16	16	8	10

I investigated some possible factors that may have affected the irregular distribution of the conditional sentences for making hypotheses, such as the specific features of the subject-related discourse, the CLIL teacher language competence and the students' language competence. It can be assumed that the overall subject discourse maintains its own features from lesson to lesson within the same scientific subject. However, since the participants were the same throughout the nine lessons observed for each school subject, I ruled out the possibility that the irregular distribution might depend on the CLIL teachers' and students' language competence. I found some variation, though, in the use of conditionals in Biology, Chemistry, and Earth Science although these subjects are taught by the same CLIL teacher (T1).

Thus, it can be supposed that this irregular distribution is affected by other factors such as, for example, the content learning objectives of each CLIL lesson. Nevertheless, the data did not provide significant evidence to support the assumption

that the ALF of hypothesising can be quantitively affected by the specific topic of a lesson. As a matter of fact, in Biology, lessons 1 and 6 were respectively about the "digestive system" and the "circulatory system" and lesson 5 was about the "respiratory system". In Chemistry, lesson 3 was about "change of matter", lesson 6 about "chemical reactions", and lesson 7 about "atomic number and mass number". In any case, specific topics are supposed to require more frequent verbalization of hypotheses than others. Actually, in Maths, for example, all the nine lessons observed were on the topic of "probabilities" but despite this, in some lessons the number of hypotheses was much lower than in others, spanning from 3 occurrences in lesson 5 to 19 occurrences in lesson 6.

Finally, I considered whether the irregular distribution of hypothesising might be due to the type of tasks carried out by the CLIL teachers. In the case of Chemistry, for example, in lessons 3 and 6 we observe the lowest number of occurrences (8 and 5, respectively), which is definitely lower than the average of occurrences in this subject (12). It should be considered though that the two lessons took place in the Science laboratory instead of in the classroom: the students had to carry out some experiments and T1 was constantly providing instructions. The experiments were followed by a phase in which the CLIL teacher provided examples in order to simplify some theoretical issues and also to guide the students while they did out some exercises.

Checking exercises is a type of teaching activity which may require the teacher's ability to improvise and interact with students more spontaneously than in other phases of the lesson in which IRF (Initiation-Response-Feedback) is dominant or when new contents are introduced. It is no coincidence that during this type of activity, the CLIL teacher was less comfortable with making hypotheses and used the least number of conditionals, whereas in lesson 7, in which I counted the highest number of hypotheses, T1 was involved in other activities like asking students to infer, for example, the different mass numbers and the numbers of protons and neutrons:

T1*: How do you get the number of neutrons if you know the atomic number? […] If you change the number of protons…*

(Chemistry, 11 November 2015)

As regards the Biology lessons, T1 realized only 4 hypotheses in lesson 1, whereas in lesson 7 the number was four times bigger, that is 16. A deeper investigation into the type of discourse used in these two lessons revealed that they had a very similar inner structure, i.e. an initial phase of recap, followed by the introduction of the new topic, an activity with a video and some final activities. Also in this case, the teacher spoken discourse was mainly monologic and controlled. When a more dialogic discourse took place, it exploited an IRF pattern only. It can thus be argued that the fewer occurrences of hypotheses in the two lessons may be due to the more descriptive feature of Biology subject discourse which did not encourage the teacher's explicit use of hypotheses.

I then investigated the linguistic forms the teachers used most for verbalizing hypotheses. As explained, I focused on the specific linguistic aspects of hypothesising and in particular on the teacher's preference as to the position of the adverbial subordinator *"if"* within each hypothetical structure. Usually the main clause and the subordinate can be ordered both in initial or final position. "It doesn't matter which comes first" (Thomson and Martinet, 1986:197). On the other hand, Celce-Murcia and Larsen-Freeman (1999) identified some situations in which the position of the *if clause*, either initial or final, affects the meaning conveyed (cfr. 2.3.2 for a qualitative analysis). In table 12, data have been ranked according to whether the *if clause* was in initial or in final position.

Table 15: Subordinate clause position within the conditional sentences used by the CLIL teachers in different subjects

Subject	IF clause position	
	Initial	***Final***
	%	**%**
Biology	92,9	7,1
Chemistry	91,2	8,8
Earth Science	94,4	5,6
Maths	88,9	11,1
Physics	84,3	15,7

T1: ***If I*** *squeeze it too much it will explode but it is quite resistant actually*

(Chemistry, 9 November 2015)

T1: *How can you measure the amount of C14 left* ***if you*** *don't have any C14 carbon?*

(Chemistry, 18 November 2015)

Data reveal that hypotheses have always been realized by giving preference to the initial *if clause*, with similar figures across the subjects.

As far as the meaning is concerned, according to the framework I referred to, conditional sentences in English convey different semantic relationships, namely: *factual*, *future*, and *imaginative* (present and past) (cfr. 2.2.4). Hence, the next issue I considered regarded the *types* of conditional sentences used for hypothesising, (Table 16).

Table 16: Distribution of conditional sentences according to the meaning

Subject	Conditional sentence types			
	Factual	**Future**	**Imaginative hypothetical**	**Imaginative counterfactual (past)**
	%	**%**	**%**	**%**
Biology	92.7	7.3	0.0	0.0
Chemistry	79.7	18.9	1.4	0.0
Earth Science	76.3	22.6	0.0	0.0
Maths	82.7	7.0	9.3	0.0
Physics	93.9	0.0	5.8	0.0

The factual conditional is the most frequently used type to express hypotheses in all the CLIL subjects: Biology, Chemistry, Earth Science, Maths, Physics, ranging from 93.9% of occurrences in Physics to 76.3% in Earth Science. This may be explained not only by its relatively simple structure, but also by the various semantic relationships that it can express.

By adding the number of the factual to the future types of conditional sentences, the percentage of occurrences is more than 90% in each subject, showing that the CLIL teacher seems to prefer less challenging structures. These data also show that only in Maths there is a wider variety of hypothetical structures. Future conditional sentences constitute the second most frequently used type to express hypotheses.

> T1: *So **if you high** the temperature **you will have** evaporation but **if the liquids have** a different nature, for example alcohol and water, **one of the two will evaporate** at a lower temperature, so **you will increase** the temperature very gradually* […].
>
> (Earth Science, 19 October 2015)

Finally, data show very limited use of imaginative hypothetical conditionals. In Biology and Science, I did not find one single occurrence. On the other hand, in Maths,

in 9.3% of the occurrences the teacher opted for an imaginative hypothetical structure, which is the highest percentage I found. Finally, it is worth pointing out that in the five subjects the imaginative counterfactual past has totally been avoided.

My quantitative analysis of the linguistic realization of hypotheses included a focus on the related *connectors* used in the five subjects. Table 17 reports data related to those connectors that occurred at least once in the teacher spoken discourse.

Table 17: Distribution of conditional sentences and related connectors

Subject	**Conditional sentences and related connectors**								
	Total number of conditional sentences in the corpus	**Because if**	**But if**	**Even if**	**If**	**It is as if**	**So if**	**So that if**	**Then if**
		%	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Biology	84	0	0	0	99	0	1	0	0
Chemistry	148	0	0	1	99	0	0	0	0
Earth Science	90	0	9	6	73	0	10	2	0
Maths	108	1	1	5	82	7	5	0	2
Physics	102	0	0	0	100	0	0	0	0

It was predictable that the connector *if* would be the most used across the five subjects. In Physics the CLIL teachers used *if* only, which accounted for 100% of the occurrences, and a similar occurrence was found in Chemistry and Biology (99%). In Earth Science *so if* and *but if* counted as respectively 10% and 9% of the total number of sentences analysed. Maths was the subject in which I found a wider variety of hypothetical connectors.

T3: *is correct at the 95% of the time,* ***so if*** *a person has HIV virus then the positive… the test will be positive at this rate, if it is not affected, the test will be negative because this rate is the one at which the test is correct, so negative in this case, positive in this one.*

(Maths, 19 December 2015)

T3: ***It is as if*** *a first ball were taken and a second ball were taken, please S11…*

(Maths, 11 December 2015)

The linguistic complexity of hypothesising is also given by the fact that it may require the use of modals. Hence, I also analysed to what extent the CLIL teacher used *modal verbs* to express hypotheses. The occurrence of adverbs such as *perhaps, possibly, probably* etc. was not considered.

Table 18: Distribution of conditional sentences according to the use of modals

Subject	**Modals**				
	Number of conditional sentences with a modal	**Can (not)**	**Could (not)**	**Should (not)**	**Must (not)**
	n°	**%**	**%**	**%**	**%**
Biology	6	83	0	17	0
Chemistry	14	79	14	7	0
Earth Science	8	100	0	0	0
Maths	11	55	18	27	0
Physics	16	69	13	0	19

Table 18 only reports the modals that occurred at least once across the five subjects. This means that I counted no occurrences for modals like *might* or *ought to* which are therefore not represented in the data. A few conclusions can be drawn from these

findings. First, *can* is the most used modal in all the subjects and in Earth Science it is actually the only modal used. Second, *must* is the only modal used in Physics (19%). Finally, the range of modals used in the different subjects was very limited.

> T2: *if I… if I use the appropriate international unit for volume I* ***must*** *use what?*
>
> (Physics, 7 March 2015)

> T1: *if you look at this patient's medical charts you* ***should*** *be able to recognize symptoms that should enable you to make the right diagnosis*.
>
> (Biology, 14 May 2015)

Finally, my quantitative analysis also focused on which *lexical verbs* or phrases were used as alternatives to the *if clause* for making hypotheses. The only verbs that occurred within the whole corpus are *guess, imagine, suggest,* and *suppose*. Table 19 reports these data.

Table 19: Distribution of lexical verbs in conditional sentences

Subject		**Lexical verbs and phrases**			
		Guess	**Imagine**	**Suggest**	**(Let's) suppose**
	Total number of conditional sentences	**Number of instances**	**Number of instances**	**Number of instances**	**Number of instances**
Biology	84	1	0	0	0
Chemistry	148	0	0	0	0
Earth Science	90	0	2	3	0
Maths	108	0	0	1	8
Physics	102	4	0	1	0

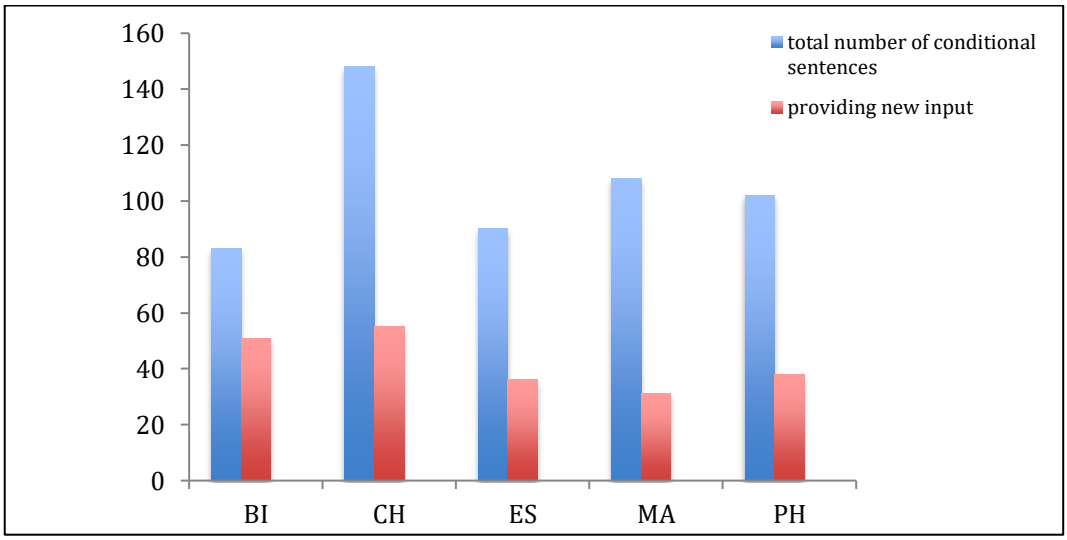
These verbs were used to express conditional meaning in only 20 occurrences. Maths is the subject in which the CLIL teacher has opted for *suppose* in 8 different cases. In Earth Sciences a very low number of hypotheses has been expressed with the verbs *imagine* and *suggest*, whereas in Physics *guess* and *suggest* were used. No alternatives to *if* clauses were used in Chemistry.

> T2: *Try and **guess**. If F1 and F2 become closer* […]
>
> (Physics, 20 March 2015)

> T3: ***Let's suppose** that this event has occurred. What is the probability of obtaining the second, a second red disc?*
>
> (Maths, 27 November 2015)

In this last part, I will focus on the specific activities of the CLIL lessons in which a higher number of hypotheses occurred. I took into account four types of activities: a) *providing new input*; b) *giving examples*; c) *giving instructions and directives*; d) *asking students questions***.** Figure 6 shows the number of conditional sentences used to make hypotheses while providing new input; this activity actually includes a series of other correlated situations such as introducing a new topic, describing or explaining a process, giving definitions, and introducing new vocabulary.

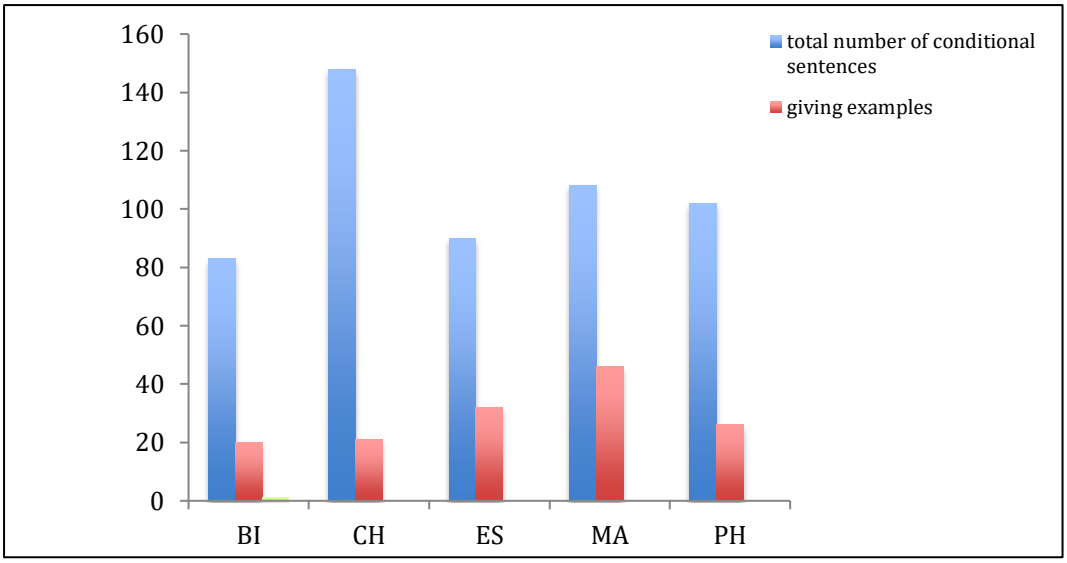
Figure 6: Use of conditional sentences to provide new input



According to these data, most of the 83 conditional sentences used to make hypotheses in the Biology lesson occurred while new input was being provided (59%); the lowest incidence was in Maths with only 29% of the occurrences.

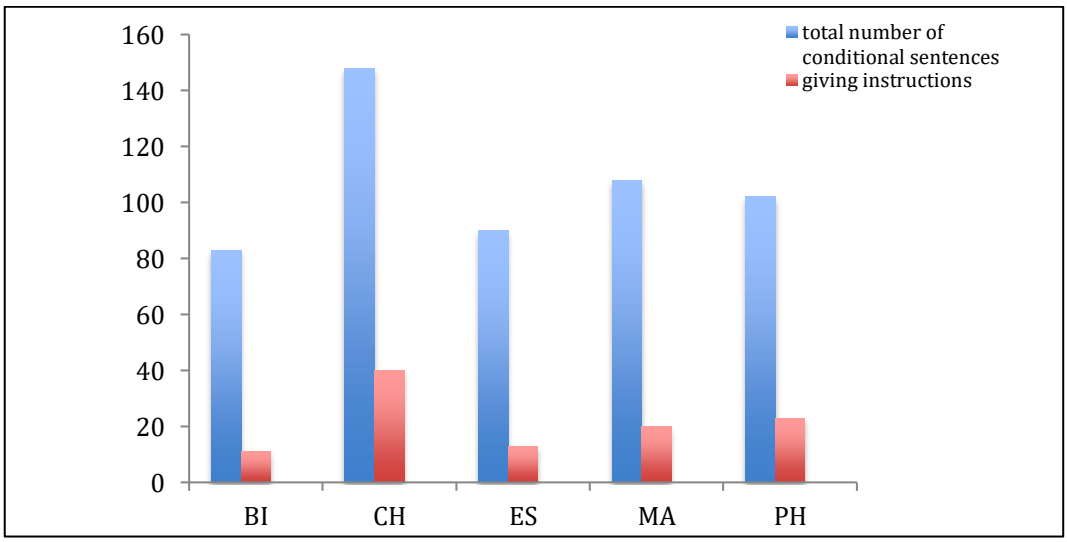
As far as giving examples is concerned (Figure 7), the highest percentage of conditional sentences to express hypotheses occurred during the Maths lessons (43.5% of 108 occurrences). On the other hand, the lowest incidence occurred during the Chemistry lessons in which only 14.2% of the hypotheses were formulated while the teacher provided examples.

Figure 7: Use of conditional sentences to give examples



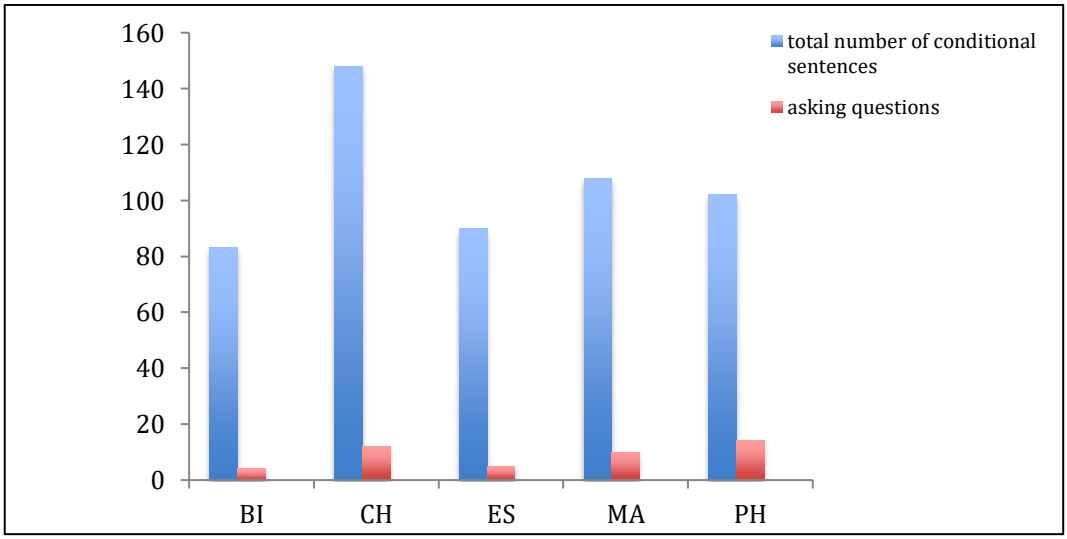
The data in Figure 8 show that the number of hypotheses formulated while giving instructions did not cover a fourth (1/4) of the total conditionals realized in any of the five subjects. Indeed, the highest number of hypothetical conditionals occurred in Chemistry, where 27% of the total number of occurrences were while the teacher was giving instructions to the students. The lowest incidence was in the Biology lessons (13.3%).

Figure 8: Use of conditional sentences to give instructions



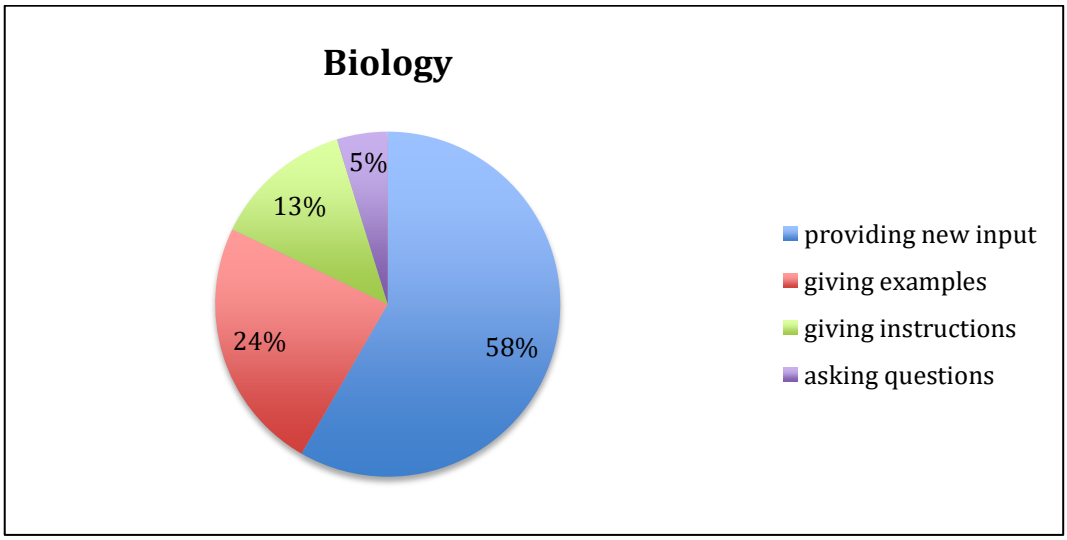
The data in Figure 9 show that the highest incidence of hypotheses realized while addressing questions to the students was in Physics, even though they occur their occurrence is modest (13.7% of 102 occurrences). The CLIL teacher of Earth Science formulated only 4.4% of the hypotheses while asking the class questions.

Figure 9: Use of conditional sentences to ask questions



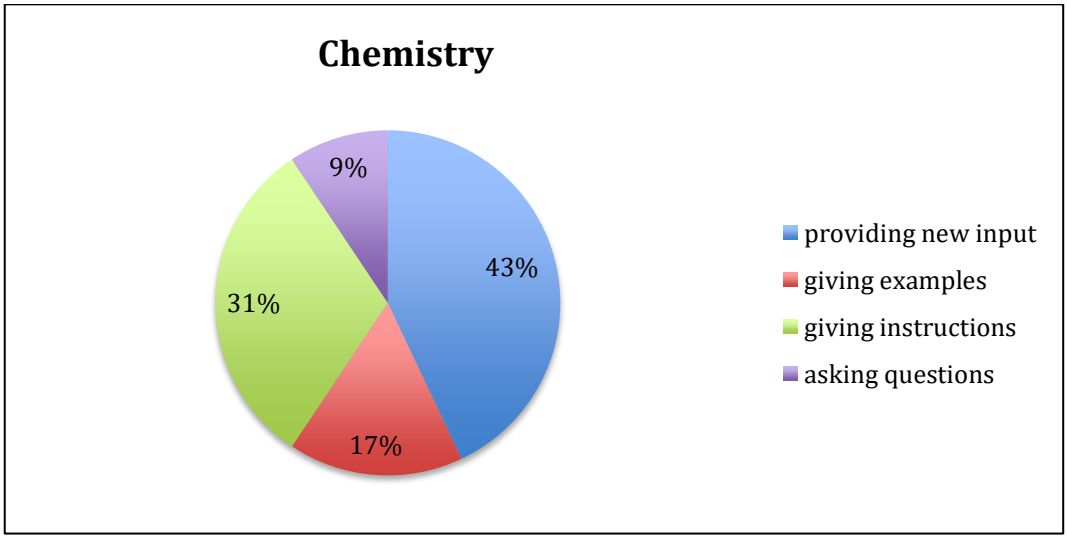
The following figures show the distribution of hypotheses in the four teaching activities analysed in each of the five school subjects involved. Across the nine lessons of Biology investigated, more than half of the hypotheses were formulated while the CLIL teacher was providing new input, whereas only 5% of the 83 conditional sentences were used to make hypotheses while asking questions to the class or individual students. In Biology, the lowest percentage of hypotheses (9%) was realized while asking the students questions.

Figure 10: Distribution of hypotheses in the four teaching activities in Biology



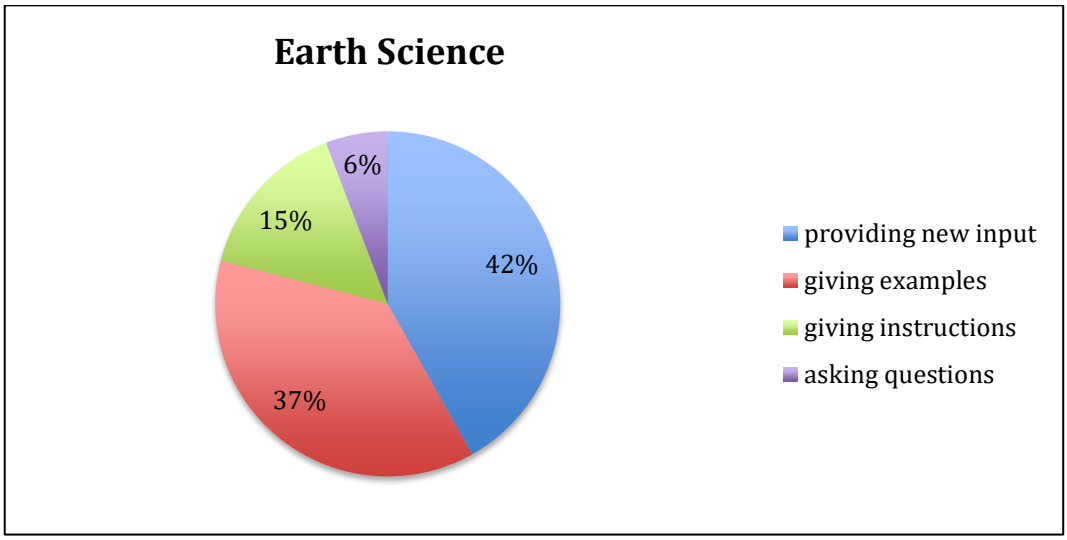
In the Chemistry lessons, providing new input and giving instructions generated the use of the hypothetical conditional for three quarters of the total occurrences (95/148).

Figure 11: Distribution of hypotheses in the four teaching activities in Chemistry



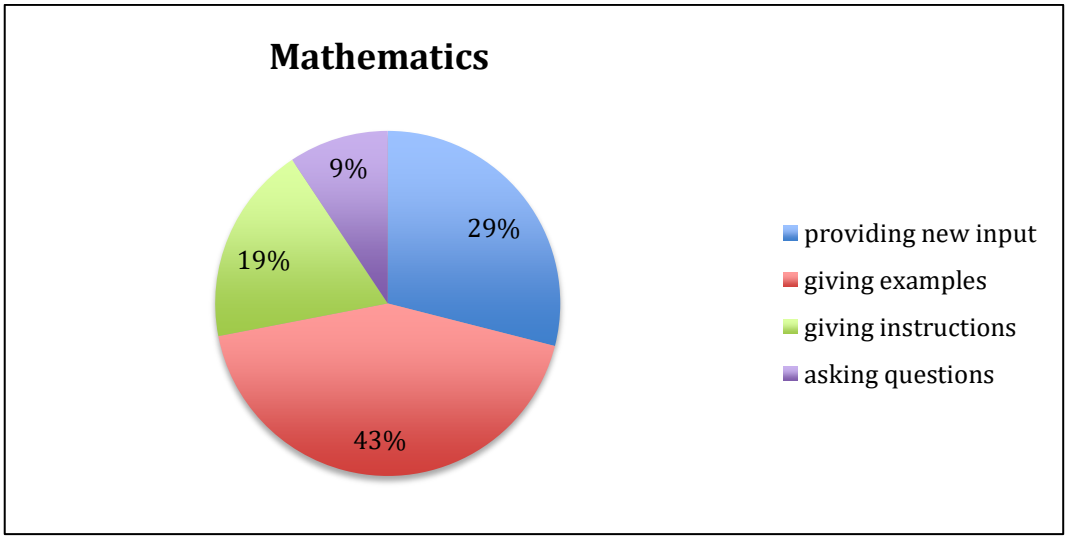
In Earth Science, providing new input and providing examples were the two teaching activities which accounted the highest incidence of hypotheses (79%). Asking questions was again the teaching phase in which very few hypotheses were generated.

Figure 12: Distribution of hypotheses in the four teaching activities in Earth Science



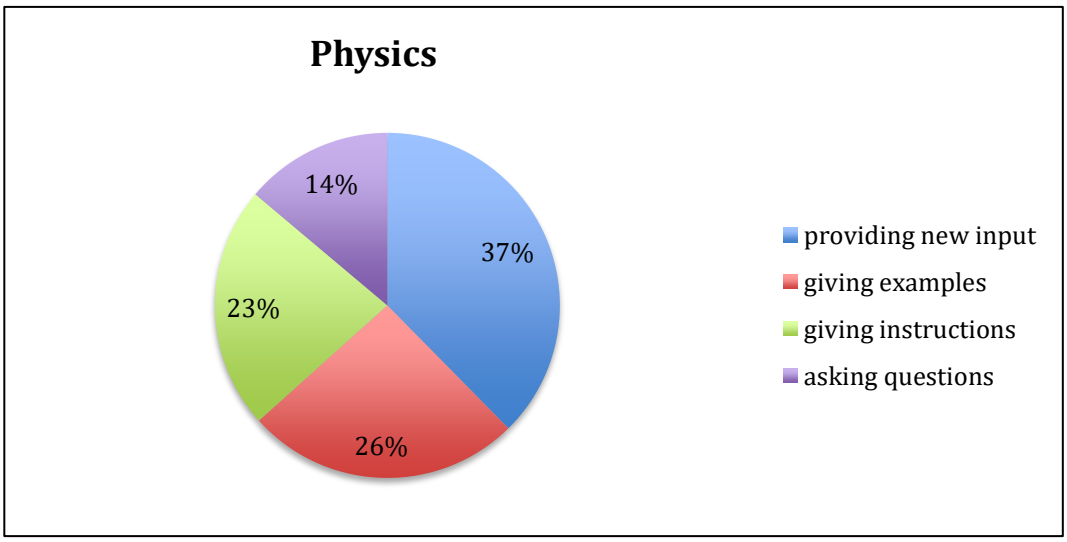
As far as the Maths lessons are concerned, providing examples was the moment in which there was the highest incidence of hypothetical conditionals. Giving instructions and asking questions together generated only one quarter of the total number of conditional sentences used to make hypotheses.

Figure 13: Distribution of hypotheses in the four teaching activities in Mathematics



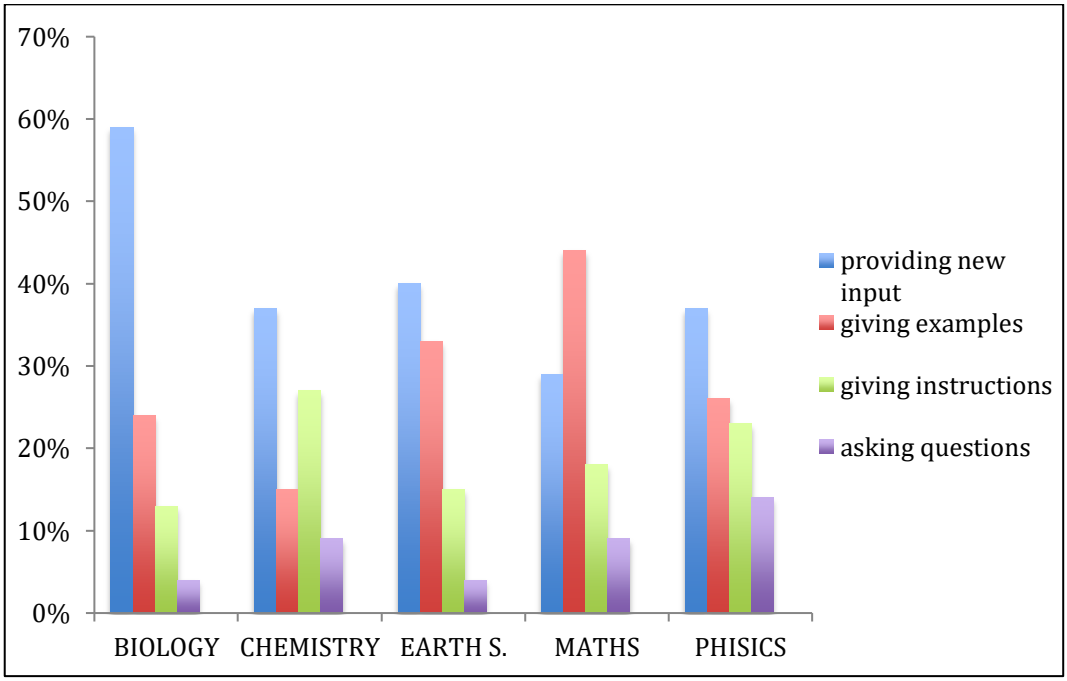
The percentage of hypotheses realized within the Physics lessons were quite balanced across the activities of providing new input, giving examples and instructions and asking questions.

Figure 14: Distribution of hypotheses in the four teaching activities in Physics



Finally, figure 15 provides a comparative overview of the data presented above.

Figure 15: Distribution of hypotheses in the four teaching activities across the subjects



Summing up, the findings from my quantitative analysis seem to highlight a number of characteristics related to the way the three CLIL teachers observed seem to deal with the academic function of hypothesising in their lessons.

1) In the whole corpus there was an average of 12 occurrences of hypotheses per class. This figure is significantly higher than the number of occurrences reported in similar studies (Dalton-Puffer, 2007; Martìn Del Pozo, 2015). This leads me to conclude that the upper secondary school context I investigated seems to encourage the use of the academic function of hypothesising, at least with regard to the CLIL teacher's spoken discourse. In particular, Chemistry is the scientific-school subject in which there was the highest number of hypotheses, with an average of 16 realizations per class.

2) The Chemistry teacher made a highly productive use of hypotheses. However the same teacher used a much smaller number of hypotheses when she taught Biology (9) and Earth Science (10). It is thus reasonable to believe that making hypotheses is linked to the CLIL subject itself and not, for example, to the CLIL teacher's language competence. The average number of hypotheses in Maths and Physics (11) is more or less the same across the five subjects (12).
3) 83.6% of the occurrences are factual conditionals (mainly "generic" and "habitual" factual conditionals). I found no use of imaginative counterfactual (in the past). Maths is the subject in which I recorded the widest variety of hypothetical structures.
4) *If* is practically the only connector used for hypothesising in Biology, Chemistry and Physics. In Earth Science and Maths a wider variety of hypothetical connectors are used. It would be interesting to investigate why T1 used *if* in Biology and Chemistry only, whereas in Earth Science she used other connectors as well.
5) *Can* and *could* are the modals which are mostly used to express hypotheses.
6) An average of 90.34% of the hypotheses were formed with the *if* clause in initial position.
7) Lexical verbs and phrases as alternatives to the *if-clause* were scarcely used to make hypotheses.
8) As regards the teaching activities in which hypothesising was generated, in the Maths lessons the highest percentage of hypotheses was realized while giving examples. In all the other four subjects, the CLIL teachers formulated more hypotheses when they provided new input. The lowest incidence of hypotheses occurred when the teacher asked questions. The most balanced use of hypothesising across the four teaching activities was observed during the Physics lessons.

In conclusion, this quantitative analysis has shown that the number of conditional sentences used by the CLIL teachers observed was extremely high. On the other hand, their formulation of the hypotheses was linguistically repetitive and with an evident

lack of variety. The latter aspect was examined in greater depth through a qualitative analysis.

2.3.2 Qualitative Analysis

The quantitative data analysed in the previous section have provided evidence that the CLIL teachers observed make a high number of hypotheses during their lessons of Biology, Chemistry, Earth Science, Maths, and Physics but the linguistic realization for this language academic function tends to lack variety in terms of the structures, connectors, modals and verbs used. Nonetheless, the use of hypotheses in every lesson, especially while providing new input and giving examples, suggests teachers have some kind of familiarity with this academic function.

A qualitative analysis of the data, which is presented in this section, will illustrate how, despite the lack of the linguistic variety already evidenced, CLIL teachers were able to convey a wide range of hypothetical meanings. In particular, I will address the second overarching research question of my study, that is how the function of hypothesising is used by CLIL teachers and delve into two specific issues:

A) how specific lexicogrammatical features are used for hypothesising
B) what type of hypotheses are used and for what purpose

My reference tool for this qualitative analysis is the framework provided by Celce-Murcia and Larsen-Freeman (1999) which was illustrated in 2.2.4.

A) How specific lexicogrammatical features are used for hypothesising

The three language features I will consider are:

A1) the structures (factual, future, imaginative hypothetical, imaginative counterfactual);
A2) the position of the subordinate if;
A3) the modal verbs;

The use of these language features revealed some interesting aspects in terms of the CLIL teachers' use of the function of hypothesising, and the variety of meanings they managed to convey.

A1) How the conditional structures are used

It has already been established that the *factual conditional* was quantitatively the most frequent structure across the teaching of the five subjects investigated. The explanation for this choice may be twofold. First, since this structure can be formulated using the present simple tense in both clauses, it is syntactically simple.

> T3: ***If*** *the bag* ***is*** *full of black balls, nothing else than black balls in the bag,* ***the event is*** *certain*.
>
> (Maths, 20 November 2015)

The reduced linguistic challenge required by the use of this structure allows the CLIL teacher to put more attention on the subject-related content. Moreover, as already illustrated, the *factual conditional* can convey a wide array of meanings: 1) *generic*, 2) *habitual*, 3) *implicit*, 4) *explicit*. I will consider how each meaning was expressed through examples taken from the lesson extracts.

1) Generic

> T1: *These are forbidden to eat it now because mercury is toxic* ***if you ingest*** *it* […]
>
> (Biology, 28 May 2015)

Here the teacher expresses an absolute relationship that is true and unchanging, based on the scientific principle that mercury is indisputably toxic.

2) Habitual

T3: ***if you have*** *some problems,* ***you have to*** *join with people who have the texts* […]

(Maths, 5 December 2015)

In this case the relationship is not bound in time; moreover it is based on a habit, as in the "generic" conditional. These relationships are typically or habitually true and frequent in conversation as in the extract above. The situation is in fact common in spoken classroom discourse and usually occurs when the teacher gives instructions to the class. The two clauses have the same tense, namely the present. For both general and habitual conditionals it is possible to substitute "when" or "whenever" with "if" and still express more or less the same idea:

T1: *These are forbidden to eat now because mercury is toxic* ***when****(ever) you ingest it* […]

(Biology, 28 May 2015)

T1: ***When(ever)*** *you have some problems, you have to join with people who has the texts* […]

(Maths, 5 December 2015)

Actually, I found no cases in my corpus in which the CLIL teachers used "when" or "whenever" instead of "if".

3) Implicit

T: ***If you eat*** *too much sugar during your life,* ***these receptors do not work properly****, they are sort of too tired to carry glucose, they become* […].

(Biology, 23 April 2015)

The *If clause* indicates an event that is bounded in time and the result clause refers to an action or event that can be logically inferred from this. From a semantic point of view, the substitution of *if* with *when* or *whenever* would make the sentence incongruous, and in fact I found no cases in which it occured.

4) Explicit

> T2:[…] ***if the area is*** *the same and here I have a great height* ***I must have*** *a small basis, you know.*
>
> (Physics, 7 March 2016)

The *subordinate if* is used here as the basis for making an explicit inference. T2 is standing next to the whiteboard. She is explaining to the students that if they have the same area (of the figure to calculate) with a great height, they 'must have a small basis'. The result clause thus contains an inferential modal, typically *must* or *should*. I will look into the use of modals later in this chapter.

This extensive use of the *factual conditional* restricted the use of other conditional structures such as *future conditionals* and *imaginative conditionals*. As regards the *futures*:

> T3: *so,* ***if*** *a person* ***has*** *HIV virus then the test* ***will be*** *positive at this rate,* ***if it is not*** *affected, the test* ***will be*** *negative because this rate is the one at which the test is correct, so negative in this case, positive in this one* […]
>
> (Maths, 19 December 2015)

In this case T3 wants to express a lower degree of certainty than that expressed by using the *factual conditional* in the previous extract. Moreover, the choice of the *future conditional* highlights the time-bound relationship between the subordinate and the main clause. In this extract, the subordinate condition is in the present whereas the main clause expresses a result that will be realized in the future as a consequence of what is expressed in the subordinate. Evidently, in this discourse the time-bound

relationship that the *future conditional* provides is preferred to the relationship conveyed by the *factual conditional* (of truth and unchanging).

As regards the (very limited use of) *imaginative conditional*, findings reveal that this structure was mainly used to hypothesise about something which is not true and based on facts, as the extract below exemplifies:

T3: *Because **if** the game **were** fair, the sum **would be** zero* […]

(Maths, 5 December 2015)

Here the teacher opted for the *imaginative hypothetical conditional* as the game they were talking about was not fair. T3 expresses what she perceives to be unlikely yet a possible event or state in the *if* clause.

Finally, the lack of instances of *imaginative counterfactual conditionals* already evidenced in the quantitative analysis can also be explained by the fact that the CLIL teachers were more likely to speculate about the present than about the past, such as in this example: "What would have happened if he had ingested or had not ingested mercury". It may be argued whether speculation on the past is indeed needed in Science teaching and learning or it is just marginal. We may also argue that this choice can be seen as strategic in order to avoid the use of more complex hypothetical structures.

A2) The position of the subordinate if

The other issue I decided to investigate pertains to the position of the *subordinate if*. Whereas in either initial or final position it would be syntactically grammatical, I selected some extracts in which the position of the *subordinate if* changes the semantics of the hypotheses. I report below some examples in which the CLIL teachers managed to convey a wide variety of meanings by using the *subordinate if* in initial position (Celce-Murcia and Larsen-Freeman 1999).

a) To introduce contrasts – T1: ***If*** *you* ***don't shut down*** *the bicuspid and the tricuspid,* ***you have*** *the flowing back of the blood into the atria but then* […].

(Biology, 28 May 2015)

b) To provide examples following generalizations – T1: ***for example, when you are under the sea...*** *and* ***if*** *you do not keep restoring the respiration, you will go into acidosis. Acidosis occurs* […].

(Biology, 30 April 2015)

c) To make inferences based on previously mentioned assumptions – T1: ***So*** *the plates keep moving apart* ***because*** *new lava comes out* ***and*** *the lava forms new oceanic crust* ***so*** *it increases the size of the plates. But* ***if they get apart****, of course the continents that are part of them,* ***get apart too*** *so they get separated and their separation is bigger and bigger when* […].

(Earth Science, 5 November 2015)

In the following extracts, the *subordinate if* in final position conveys different meanings:

a) When It follows an evaluation – T2: *Ok, so now you…****it is better if*** *you wet the filter before you start the filtration* […].

(Chemistry, 14 October 2015)

b) Within a question – T2: ***How many*** *bottles of water do you need* ***if*** *you have bottles of one litre to fill one cubic metre?*

(Physics, 14 March 2015)

c) When It is used deferentially – T1: *And you should try another experiment* ***if you want*** […].

(Chemistry, 21 October 2015)

The array of meanings and uses just reported above confirms that although hypothesising is usually formulated with a repetitive pattern, it is an academic function that can be widely and effectively exploited.

A3) Modal verbs

The last feature I have analysed is modal verbs and how they were used in conditional sentences to realize hypotheses. Quantitative findings showed that teachers made a limited use of modals within the conditional sentences. In addition, the choice was limited to *can*, *should*, and *must* thus excluding the use of other modals such as *may*, *might*, *ought to*, and *would* (cfr. 2.2.4). Also in this case, the CLIL teachers seemed to deliberately avoid exploiting the complex semantic field of modals in English as illustrated in the examples below in which modals are used at a very basic level.

The modal *can* in a hypothetical clause can convey the idea of the potentiality of doing something or something that can be done:

> T3: ***if I ask fo****r the probability of selecting A and D with no reference to their order, the situation* ***can be described****,* ***can be analysed*** *in the following way* […]. (Maths, 27 November 2015)

As regards the use of *should*, findings showed that it is used to convey a sort of 'expectation' and moderate certainty, as in the following example:

> T3: ***If it were*** *a fair coin,* ***heads should occur*** *with 1 over 2, with a probability of 1 over 2, not 2 over 3. So, the coin is* […].
>
> (Maths, 27 November 2015)

In the following extract, c*ould* (second and third instances) is used to convey a low degree of certainty:

> T3*: if we used three dices* ***we should think*** *about three coordinates X and we* ***couldn't draw it*** *in the plate.* ***It could be*** *a very easy way to understand how*

the experiments works but ***it could be*** *very difficult to be drawn and what about working with four dices?*

(Maths, 14 November 2015)

As regards *must,* which was used in the Physics lessons only, I noticed that it was used to convey hypothetical obligation.

T2: *If you had…****if you must fill one cubic metre*** *with water, how much water do you need?*

(Physics, 14 March 2015)

T2 asks the students to imagine that they have to fill in one cubic metre with water. The hypothetical obligation "if you must fill" makes the example of filling one cubic metre of water more real and closer to reality, thus, easier to hypothesise. It is also interesting to notice that T3 was about to formulate this hypothesis using the phrasal modal *had to*, past tense of *have to* but then she stopped and reformulated the hypothesis using the present form *must* in the subordinate if clause. In the following extract T2 avoids a complex question form opting for a more straightforward declarative form to convey the intended meaning.

T2: *One litre is if I…* ***if I use*** *the appropriate international unit for volume* ***I must use what****?*

(Physics, 7 March 2015)

B) what type of hypotheses are used and for what purpose

I will now focus on the second issue of my qualitative analysis aimed at identifying the main function of hypotheses in a CLIL Science lesson. The quantitative analysis has illustrated the distribution of hypotheses at some specific stages of the lessons, that is when the CLIL teachers *provided new input*; *gave examples* and *instructions* or *asked questions* (cfr. 2.3.1) So I decided to investigate how the teachers made hypotheses in these four situations.

B1) Providing new input

Providing new input was found to be the most frequent activity across all the subject lessons observed. Except for the lesson of Maths, this activity consists in introducing new information, describing a process, giving definitions/new vocabulary. The first extract exemplifies how hypotheses are conveyed at this stage of the lesson.

> T1: *This is very very important. The particles are always conserved* ***even if they are rearranged in a different way****, so you have the hydrogen and the oxygen atoms mixed… rearranging, forming new kinds of chemical bombs but they're still there*.
>
> (Chemistry, 21 October 2015)

T1 anticipates that she is going to say something of particular importance, and calls the students' attention to what she is about to say. The new information is that "The particles are always conserved even if they are rearranged in a different way". After giving the new information, T1 also provides further clarifications. In the extract below the new information was essential to carry out an exercise:

> T2: *we can say that we have minimum or … and say that the function "X" a low so reaches the peak and its low, increases, decreases, remains constant.* ***If the graph we represent*** *is a graph Keplero plane,* ***we have P versus V that is represented X pressure in function of X****. So let's try to do an exercise.*
>
> (Physics, 7 March 2015)

The new information is related to the Keplerian plane and the fact that they would "have P versus V". Without these coordinates the students would have not been able to carry out the exercise. New input was often supported by a conditional sentence, also when teachers were involved in describing a process. The two extracts below illustrate how the CLIL Science teachers are involved in describing the relationships of cause and effect, typical of any scientific process.

T1: *Here you have two examples of evaporates, rock salt and gypsum and in this case you have evaporation in water,* ***if the water contains*** *gypsum […] gypsum is calcium sulphate and* ***if the water is filled with calcium sulphate and evaporates,*** *the precipitation of calcium sulphate will X gypsum but you can have also some kind of limestone*.

(Earth Science, 15 October 2015)

New input is also given while introducing definitions or explaining new vocabulary.

T3: *So, some other definitions… here are some concepts that are listed … exhaustive events … most …more events are set to be exhaustive* ***if all together they cover*** *all the possible outcomes.*

(Maths, 14 November 2015)

In order to help the students understand the meaning of "exhaustive events", T3 uses a factual conditional to explain that in order to talk about exhaustive events, all these events need to cover all the possible outcomes. In other situations, the CLIL teacher switched to Italian in the main clause in order to convey the meaning of a word.

T2: *"truffare" also, and if you cheat it is also "baro" e anche "trucco" e "swindle" è più "frode".*

(Physics, 14 March 2015)

B2) Giving examples

The other communicative activity in which hypotheses were used was when the CLIL teachers gave examples, as in the following example:

> T2: ***if you have alcohol and water together****, you know that* ***alcohol will change*** *its state from liquid to vapour earlier at a lower temperature compared to water, which changes its state from liquid to vapour at the higher temperature.*
>
> (Physics, 15 October)

Here T2 not only gives an example, but she also draws her students' attention to previously acquired knowledge, the fact that alcohol (requires lower temperature than water to) changes its state from liquid to vapour at a lower temperature than water.

B3) Giving instructions

The next activity that was typical for the occurrence of hypotheses was when the CLIL teachers gave instructions to the class.

> T1: *so* ***if you look at*** *the exercise number 5 and you try to complete the binary key diagram we can start with the experiment. Binary key means that you have a yes no possibility.* ***If you say yes you go*** *in one direction,* ***if you say no you will go*** *in another direction and then again you have a question and a yes no possibility. Ok? So, you work on this binary key diagram and then we'll check the answer together*
>
> (Chemistry, 14 October 2015)

The extract above shows how T1 gives instructions to her students to carry out a binary key exercise. It is interesting to notice that T1 first used a factual conditional "If you say yes you go in one direction" but then she used a future conditional for providing the second instruction "if you say no you will go in another direction". Probably in

this case she just wanted to highlight the time-bound relationship of the second hypothesis, followed by the option to answer "yes and you go in one direction". In the extract below I provide another example in which the teacher makes hypotheses using a factual conditional while giving instructions to the class:

> T2: ***if you if you*** […] *a point on your graph with the rope with at one focus and at the other focus and* ***(if) you connect*** *these points* ***you have*** *the distance P from P to + the distance from P to the second focus, this is the constant which is in reality the length of the rope.*
>
> (Physics, 14 March 2015)

4) Asking questions

The last activity I considered deals with the use of hypotheses while addressing questions to the students. The first consideration I could draw from my findings was that asking questions was the teaching strategy with the lowest occurrence of hypotheses. This may be due to different reasons. Firstly, the student talking time was extremely limited and so I also expected students to be asked a very limited number of questions. Secondly, asking questions tends to be a very spontaneous oral activity within classroom interaction. Thus, it is reasonable to assume that CLIL teachers hardly make up hypothetical questions spontaneously, since it requires a higher degree of confidence with the foreign language system.

> T1: *Ok,* ***if you have*** *this fibrosis tissue in the alveoli X then …* ***what do you think*** *it happens to the external respiration?* ***If you have fibrosis tissue*** *instead of…* ***what is*** *the role of the alveoli?* […] ***If you have*** *this X this fibrosis tissue, it becomes very thick and so the diffusion is much less efficient and so you have shortness of breath, chronic coughing and many symptoms that are typical* […].
>
> (Biology, 14 May 2015)

The extract above exemplifies a common tendency of the CLIL teachers to ask their students questions. The hypothetical questions are linguistically extremely simplified and the teacher tends to repeat the same pattern (in this case the subordinate "if" in initial position and the phrase "if you have"). Moreover, this example provides me with the opportunity to show what I meant when I referred to the very limited spoken production from students. Here T1 addressed 2 questions to her students but did not actually let them answer. In fact T1 herself answered the questions. It was as if she used the questions only as a strategy for introducing new information.

Summing up, the findings from my qualitative analysis aimed at investigating how and in which contexts the CLIL teachers observed verbalized the ALF of making hypotheses seem to point to a number of trends.

1. As regards the use of conditional structures, the array of semantics conveyed by the factual conditional made it obviously the most frequent structure employed. This choice, unequivocally made by all three CLIL teachers, is also explained by their being apparently unfamiliar with more linguistically complex structures.
2. The same lack of complete confidence with the English language system is also to be seen in how they used modal verbs within the hypothetical sentences, with their usage proving to be syntactically limited.
3. Sometimes it was ascertained that the formulation of an interrogative sentence could be an obstacle to the meaning-making process, especially if it included a modal verb.
4. CLIL teachers generally tended to simplify the form of conditional sentences. However, this did not seem to affect the meaning they intended to convey.
5. Making hypotheses occurred in several teaching activities throughout the CLIL lessons, such as providing new input or giving examples, confirming the central importance of this ALF in the discourse of the science classroom.

T1's hypothesising deserves a consideration of its own. She was the only teacher who was observed while teaching three subjects rather than one: Biology, Chemistry, and Earth Science. Comparing her way of formulating hypothesis it turned out that in Earth

Science she produced higher number of hypothesises when she gave examples; on the other hand, when she taught Chemistry a more frequent use of hypotheses occurred when she provided instructions. This was probably due to the fact that most of the activities in this lesson involved a high number of experiments which required the delivery of precise instructions.

CONCLUSION

The prime aim of this empirical study was to investigate whether the teaching of scientific school subjects in English fosters the teacher's use of the ALF of hypothesising. I investigated this issue from both a quantitative and a qualitative point of view.

The research was conducted over two school years (2014/2015 - 2015/2016) and involved three in service CLIL teachers in three upper-secondary schools in Milan. The corpus of data collected during the study consists of the transcriptions of 45 audio-recorded lessons in five scientific-content subjects: Biology, Chemistry, Earth Science, Maths and Physics. The teachers involved are CLIL-trained teachers.

The study aimed to address two overarching questions. With regard to the first research question, that is *how much hypothesising there is in a scientific-subject CLIL lesson*, an average of 12 occurrences per lesson across the five subjects investigated seems significant enough if compared to the findings in similar studies. The distribution of hypotheses across the 9 lessons in each subject was not constant, spanning for example from 3 to 19 occurrences per lesson in Maths. With an average of 16 hypotheses per lesson, Chemistry turned out to be the subject with the highest number of occurrences, a figure that was approximately 45% higher than an average 9 hypotheses in Biology. As the same teacher (T1) was involved in these lessons, these differences seem to be related to the nature of the subject itself and the different teaching strategies she used, especially when she conducted her lessons in the science laboratory. It would be interesting to understand why, for example, T1 used such a variety of connectors in Earth Science but, at the same time, limited her choice to *if* in the other subjects. Despite the similarities between the two subjects, T1 employed a different teaching style and this probably affected the number of hypotheses she used.

The quantitative method used for this study was also aimed at identifying the most selected lexicogrammatical elements to realize hypothetical conditionals, and the teaching activities in which they were used more frequently. In short, findings revealed that the *factual conditional*, the *subordinate if in initial position*, and the modal *can* represented the most "frequent" choices made by the CLIL teachers observed. Moreover, the highest number of hypotheses in the lessons occurred when the CLIL

teacher provided new input, whereas I found the least number of instances when students were asked questions. This seems to suggest that the CLIL teachers are still not familiar enough with the structures needed to ask hypothetical questions and evaluate the correctness of the students' responses. In addition, the type of teacher-centred lesson did not encourage the use of hypothetical questions.

The second research question of the study tried to address *how the academic language function of hypothesising is used by CLIL teachers*. According to the results of this study, the three Italian CLIL teachers consistently formulated hypotheses that were syntactically simple and repetitive, as though they relied on a 'ready-to-use' pattern any time they needed to formulate hypotheses. This is also confirmed by the "personification" of nearly all the hypotheses through the use of the personal pronouns "you/we" This does not mean that their hypothesising was not effective. In most cases, it was linguistically coherent and grammatical. However, they still seemed to be far from exploiting the full syntactical and semantic potentiality of this ALF. For example, in some cases the choice between the factual and future conditionals was questionable. Moreover, none of the three CLIL teachers ever speculated about the past, and the lack of imaginative counterfactual conditionals in the corpus confirmed this finding.

Among the CLIL teachers observed, T1 deserved a deeper analysis. Unlike T2 and T3, she was observed in the three different classes she taught: Biology, Chemistry, and Earth Science. Her use of hypotheses shows some common features in the teaching of the three subjects. For example, T1 never used the *imaginative counterfactual*, *if* is the connector she used most, *can* is the modal verb most employed, and a very limited use is made of other verbs or phrases as an alternative to *if conditional*s. Similar findings can be related to T2 and T3. However, when I compared the data collected during the Chemistry and Biology lessons, I found a 45% difference in terms of average number of hypotheses verbalised. In addition, in Biology T1 used a double number of negative hypothetical structures compared to Chemistry and Earth Science. Moreover, T1 only exploited a limited range of connectors in Earth Science while in the other two subjects she only used *if*. A last difference regards the use of lexical verbs. In Earth Science T1 used *suggest* and *imagine* but she did not use these verbs in Biology and Chemistry. It can be argued that the three CLIL teachers have built up

a sort of "survival toolkit" to deal with hypothesising which does include only specific structures.

The analysis of the distribution of hypotheses in Biology, Chemistry, and Earth Science during particular teaching activities provided additional findings. When T1 provided new input in her lessons, she used a higher number of conditionals in Biology than in Chemistry or Earth Science. On the other hand, in Chemistry the hypotheses were more frequent while giving instructions rather than providing examples. Finally, in Earth Science she produced hypotheses mainly when she gave examples. The fact that in Chemistry she set up several experiments may explain the higher incidence of hypotheses to give instructions.

Due to time constraints I did not have the opportunity to carry out stimulated recall sessions with the three CLIL teachers involved in the study. This would provide additional data for my qualitative analysis. Another limitation of the current study stems from my preliminary decision to narrow my data collection and analysis to one ALF only, namely making hypotheses. This means that, by choice, other ALF used in science-subject CLIL lessons were not investigated. For example, with more time, I would also have observed the use of hypothesizing by the same CLIL teachers during their non-CLIL lessons in order to investigate possible differences and similarities and how these would affect the efficacy of their teaching.

In conclusion, it seems that the CLIL contexts investigated only partly fostered the teacher's use of the ALF of hypothesising. Although they provided a considerable number of occasions for using this ALF, the quality of the realizations was restricted. However, it is worth highlighting that, despite the basic lexicogrammatical features of the hypotheses analysed, the CLIL teachers displayed a good overall command of the academic function of hypothesising and they were able to use this ALF to cover a wide range of uses needed in the process of meaning-making. However, their "survival toolkit" was not always adequate for the teaching needs at a upper secondary school level.

I hope this study will contribute to the CLIL research in the Italian context, where most CLIL practices have been implemented over the past ten years. In particular, a number of findings from the study can be of interest for CLIL teacher trainers and be used to plan data-based tasks aimed at developing CLIL teachers'

language awareness of their use of academic language functions, with a focus on hypothesising.

Appendix 1

European initiatives, projects and official documents promoting language learning and CLIL implementation in Europe

1. 1962-1972: *The Major Project* was one of the earliest programmes of such sort and was aimed at intensifying modern language teaching for increasing cooperation among member states and supported a widely spoken language to all students from age 10. Moreover, also a more skilled teacher preparation and up-to-date teaching methods were strongly recommended (Trim, 2007).
2. 1971-1981: *Project 4 - Modern Languages, improving and intensifying language learning as factors making for European understanding, co-operation and mobility* was a European Commission project which involved teachers in numerous pilot projects, focused on some technical aspects such as planning tools, teaching frameworks and material development (Trim, 2007).
3. 1976: European Council, *Resolution of the Council and of the Ministers of Education, meeting with the Council – of 9 February 1976 - comprising an action programme in the field of education*, Official Journal No C 38/1.
4. 1982: *Recommendation* No. R 82 – 18 invited school to offer a range of languages to their students and to promote their students' and teachers' participation to international exchanges.
5. 1982-1987: *Project 12 - Learning and Teaching Languages for Communication* was a project mainly focused on teachers training and aimed at producing and sharing materials for educational systems.
6. 1994: David Marsh of University of Jyväskylä, Finland coined the term *CLIL* (Marsh, Maljiers & Martiala, 2001) that refers to situations where subjects, or parts of subjects, are taught through a foreign language with dual-focused simultaneous aims: learning content and of a foreign language.
7. 1995: *White Paper on education and training, Teaching and Learning – Towards the Learning Society* put emphasis on plurilingual education in Europe, suggesting that secondary school pupils should study certain subjects

in the first foreign language learned, as is the case in the European schools".

8. 1995: European Council, *Resolution on improving and diversifying language learning and teaching within the education systems of the European Union* (31 March 1995), referred to 'the teaching of classes in a foreign language for disciplines other than languages, providing bilingual teaching'. It also proposed improving the quality of training for language teachers by 'encouraging the exchange with Member States of higher education students working as language assistants in schools, endeavouring to give priority to prospective language teachers or those called upon to teach their subject in a language other than their own'.
9. 1998-2001: *TIE-CLIL* promoted plurilingualism through the introduction of Content and Language Integrated Learning in five different EU languages (English, French, German, Italian, Spanish). The major aim of TIE-CLIL was to provide pre and in-service development programmes in CLIL for language teachers and subject teachers through building on existing knowledge of this field, to provide state-of-the-art understanding of theory and practice.
10. 2000: European Council, *The Lisbon Special European Council (March 2000): Towards a Europe of Innovation and Knowledge*. Available at http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=URISERV:c10241&from=EN (January, 2018).
11. 2001: *The European Year of Languages* helped draw attention to the fact that the promotion of language learning and linguistic diversity could be achieved through a wide variety of approaches, including CLIL type provision.
12. 2001-2003: *ALPME* (Advanced Level Programme in Multilingual Education) jointly coordinated by a group of 9 universities that had participated at the *TNP* (*Thematic Network Project in the Area of Languages* - 1997-1999). The aim of the project was to develop the basis for a European curriculum for teachers in multilingual schools.
13. 2002: *Barcelona European Council*: the EU Heads of State or Government called for further action 'to improve the mastery of basic skills, in particular by teaching at least two foreign languages from a very early age'.
14. 2003: European Commission, *Promoting Language Learning and Linguistic*

Diversity: An Action Plan 2004-2006. COM (2003) 449 nal. Brussels. 20 July 2003. Available at http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri= CELEX:52003D C04 49&from=EN (January, 2018).

15. 2004-2006: *The Action Plan* considered CLIL an excellent alternative to the formal language instruction in general education also without requiring additional instructional time.
16. 2004-2007: *CLIL Matrix* was produced by an international team (Anne Maljers and David Marsh among the others) working under the auspices of the European Centre for Modern Languages (ECML) programme of activities 2004-2007. The CLIL Matrix is an awareness-raising and training tool for teachers who wish to consider the skills and knowledge necessary for achieving quality CLIL to examine the extent to which they are prepared for teaching through CLIL.
17. 2005a: European Commission, *A New Framework Strategy for Multilingualism*. Available at http://eur-lex.europa.eu/legal-content/EN/TXT /?uri=CELEX :520 05 DC0596 (January, 2018).
18. 2005b: European Commission, *The 2678th Council Meeting - General Affairs* - gathered in Luxembourg, 3 October 2005. and External Relations. Available at http://europa.eu/rapid/press-release_PRES-05-241_en.htm (January, 2018).
19. 2006-2009: *CLIL across Contexts: A scaffolding framework for CLIL teacher education*. Funded by University of Luxembourg, European Union, and MENPF set three main objectives: to identify effective practice in secondary CLIL settings by conducting classroom observations; to describe skills and raise awareness of scaffolding learning of content and language; to develop a framework for CLIL teacher development across contexts.
20. 2007: ECML, *Research and Development - An introduction to the current European context in language teaching*, Available at http://citeseerx. ist. Psu . e d u /viewdoc/download?doi=10.1.1.118.6734&rep=rep1&type=pdf (January 2018).
21. 2008: *Multilingualism: an asset for Europe and a shared commitment*. It was a strategic European Commission Communication in which it was established language policy as a cross-cutting topic contributing to all other EU policies.

22. 2008-2010: *CLIL Teacher Education Framework* (Marsh, D., Mehisto, P., Wollf, D. and Frigols-Martìn, M.J., 2011), focused on curriculum development for CLIL. The main specific objectives were: to produce both an initial/in-service CLIL teacher education curricula framework; to work with regional and national networks so as to both test and disseminate information on the framework during the project cycle; to launch national / regional CLIL multiplier points with a view to encouraging the set-up of practitioner networks; to disseminate information on both CLIL and the curricula frame as tools for implementing CLIL to administrative, publishing, higher education and other stakeholders.
23. 2010: European Council, *Europe 2020* shifted the attention to the strategies for the economic growth and stability to facilitate cross-border mobility of EU citizens. A certain competence in a foreign language and the preparation for the job market appears closely connected. Those recommendations were particularly prominent for those countries, like Italy, that were suffering a high percentage of unemployment and where mastering a foreign language was a strongly recommended prerequisite to solve the problem.
24. 2012: ECML, *Literacies through content and language integrated learning: effective subjects and languages*. Available at http://pluriliteracies.ecml.at/en-us/Home/Project-information (January 2018).
25. 2012 *Rethinking Education Strategy* (EC, 2012, paragraph 2.1) insisted on the link between language learning and economic achievement for today's globalizing world, remembering the "mother tongue plus two" principle stated in the *White Paper.*
26. 2012 European Commission: *Eurobarometer Survey, Europeans and Their Languages*. Available at http://ec.europa.eu/languages/languages-of-europe/eurobarometersurvey_en.htm (January 2018).
27. 2012 European Commission: *Rethinking Education: Investing in skills for better socio-economic outcomes*. COM (2012) 669 nal. Strasbourg. Strasbourg, 20.11.2012 Available at https://epthinktank.eu/2013/05/25/rethinking-education/ (January 2018).
28. 2012-2015: ECML, *Literacies through content and language integrated*

learning: effective learning across subjects and languages (CLIL). The project aims to develop CLIL approaches, which teachers can use in the classroom, with a special focus on providing support for academic literacies in secondary education. A toolkit for transforming CLIL practice would be developed, evaluated, adapted and disseminated by practitioners.

29. 2013-2015 *CLIL-LOTE-START CLIL*: the overall aim of the project was to develop a teacher training programme for CLIL, with special focus on languages other than English. The programme was designed to include both distance and presence studies, to take concrete advantage of the innovations of up-to-date information and communication technologies (ICT) for purposes of evaluation and quality assurance and to utilise, wherever applicable, the common guidelines and instruments of European language education.
30. 2014 European Commission, *Improving the effectiveness of language learning: CLIL and computer assisted language learning*, 25 June 2014. Available at http://ec.europa.eu/dgs/education_culture/repository/languages/library/studies/clil-call_en.pdf (January, 2018).
31. 2016-2019: ECML, *Developing language awareness in subject classes*: In order to succeed, learners need to have a solid command of the language used in class, which is different from the language used in everyday non-academic situations. The project will provide subject teachers with practical procedures to identify the needs of their learners and to support them.
32. 2016-2019: ECML, *Developing language awareness in subject classes*. Available at http://www.ecml.at/ECML-Programme/Programme2016-2019/Languageof school ing/tabid/1854/Default.aspx (January, 2018).

Appendix 2

CLIL methodology training courses in Italy

Ministero dell'Istruzione, dell'Università e della Ricerca

Dipartimento per l'istruzione

Direzione Generale per il personale scolastico

Decreto n° 6

IL DIRETTORE GENERALE

VISTO il decreto del Presidente della Repubblica 15 marzo 2010 n. 87, regolamento recante norme per il riordino degli Istituti professionali e le relative linee guida per il secondo biennio e l'ultimo anno di cui alla direttiva del Ministro dell'istruzione, dell'università e della ricerca 16 gennaio 2012, n. 5;

VISTO il decreto del Presidente della Repubblica 15 marzo 2010 n. 88, regolamento recante norme concernenti il riordino degli Istituti tecnici, che, all'articolo 8, introduce, nel quinto anno, l'insegnamento di una disciplina non linguistica curricolare in una lingua straniera;

VISTO il decreto del Presidente della Repubblica 15 marzo 2010, n. 89, regolamento recante revisione dell'assetto ordinamentale, organizzativo e didattico dei Licei, che introduce, all'articolo 10, l'insegnamento di una disciplina non linguistica curricolare in una lingua straniera veicolare, a partire dal terzo anno dei licei linguistici e nel quinto anno degli altri licei;

VISTO il proprio decreto 29 luglio 2010, con il quale è stato istituito presso questa Direzione generale il Gruppo di Lavoro CLIL;

VISTO il decreto del Ministro dell'Istruzione, dell'Università e della Ricerca 10 settembre 2010, n. 249, articolo 14, contenente la definizione della disciplina dei requisiti e delle modalità della formazione iniziale degli insegnanti della scuola dell'infanzia, della scuola primaria, della scuola secondaria di primo e secondo grado, ai sensi della Legge 24 dicembre 2007, n. 244, articolo 2, comma 416;

VISTO il decreto del Ministro dell'Istruzione, dell'Università e della Ricerca 7 ottobre 2010, n.211, regolamento recante "Indicazioni nazionali riguardanti gli obiettivi specifici di apprendimento concernenti le attività e gli insegnamenti compresi nei piani degli studi previsti per i percorsi liceali di cui all'articolo 10, comma 3, del decreto del Presidente della Repubblica 15 marzo 2010, n. 89, in relazione all'articolo 2, commi 1 e 3, del medesimo regolamento";

VISTA la propria nota prot. 10872 del 9 dicembre 2010 relativa all'avvio delle attività per la formazione dei docenti di disciplina non linguistica (DNL) in lingua straniera secondo la metodologia *Content and Language Integrated Learning* (CLIL) rivolte ai docenti in servizio;

VISTO il decreto del Ministro dell'Istruzione, dell'Università e della Ricerca 30 settembre 2011, (pubblicato nella G.U. 299 del 24 dicembre 2011), contenente "Criteri e modalità per lo svolgimento dei corsi di perfezionamento per l'insegnamento di una disciplina non linguistica in lingua straniera nelle scuole, ai sensi dell'articolo 14 del Decreto 10 settembre 2010, n. 249";

1

Ministero dell'Istruzione, dell'Università e della Ricerca

Dipartimento per l'istruzione

Direzione Generale per il personale scolastico

VISTA la direttiva del Ministro dell'istruzione, dell'università e della ricerca 16 gennaio 2012, n. 4, in materia di Linee Guida per il secondo biennio e quinto anno per i percorsi degli Istituti Tecnici a norma dell'articolo 8, comma 3, del D.P.R. 15 marzo 2010, n. 88;

VISTA la direttiva Ministro dell'istruzione, dell'università e della ricerca 16 gennaio 2012, n. 5, in materia di Linee Guida per il secondo biennio e quinto anno per i percorsi degli Istituti Professionali a norma dell'articolo 8, comma 6, del D.P.R. 15 marzo 2010, n. 87;

VISTO il Contratto Collettivo Nazionale di Lavoro del personale del comparto scuola, 29 novembre 2007 e, in particolare, gli articoli 63 e 64;

SENTITA la Direzione generale per l'Università, lo Studente e il Diritto allo Studio universitario;

SENTITE le Organizzazioni sindacali del Comparto Scuola;

CONSIDERATA la necessità di disciplinare gli aspetti caratterizzanti i corsi di perfezionamento per l'insegnamento di una disciplina non linguistica in lingua straniera, previsto dai nuovi ordinamenti dei Licei, degli Istituti Professionali e degli Istituti Tecnici di cui ai Regolamenti sopra menzionati, destinati esclusivamente ai docenti in servizio negli istituti medesimi;

DECRETA

Art.1
(Oggetto)

1. Il presente decreto definisce gli aspetti caratterizzanti dei corsi di perfezionamento per l'insegnamento di una disciplina non linguistica in lingua straniera, secondo la metodologia CLIL (Content and Language Integrated Learning), rivolti ai docenti in servizio nei licei e negli istituti tecnici.

2. I corsi di cui al comma 1 si configurano come corsi di formazione in servizio ai sensi degli articoli 63 e 64, commi 8 e 9, del CCNL del personale del comparto scuola 29 novembre 2007.

Art. 2
(Profilo del docente CLIL e articolazione dei corsi di perfezionamento)

1. Il profilo del docente CLIL in esito al corso di perfezionamento di cui all'articolo 1, è descritto nell'Allegato A, parte integrante del presente decreto.

2. L'articolazione dei corsi e la tabella dei crediti formativi universitari, che possono essere riconosciuti ai sensi del decreto del Ministro dell'Istruzione, dell'Università e della Ricerca 30 settembre 2011 (pubblicato nella G.U. n. 299 del 24 dicembre 2011), sono contenuti nell'Allegato B, parte integrante del presente decreto.

Art. 3
(Destinatari)

1. I corsi di perfezionamento sono rivolti a docenti di discipline non linguistiche dei licei e degli istituti tecnici:
   a) a tempo indeterminato;
   b) a tempo determinato in possesso di abilitazione e inseriti a pieno titolo nell'anno scolastico 2011-2012 nelle graduatorie ad esaurimento previste dall'articolo 1, comma 605, lettera C, della legge 27 dicembre 2006 n. 296.

2. I docenti assunti con contratto di lavoro a tempo indeterminato delle scuole paritarie facenti parte del sistema nazionale di istruzione possono accedere ai corsi di perfezionamento di cui al presente decreto senza oneri a carico dello Stato.

Art. 4
(Accesso ai corsi)

1. Ai corsi di cui all'articolo 1 possono accedere:
   a) i docenti in possesso di certificazioni nella lingua straniera oggetto del corso, rilasciate da Enti Certificatori riconosciuti dai governi dei paesi madrelingua, almeno di Livello C1 di cui al "QCER - Quadro Comune Europeo di Riferimento per le Lingue", che attestano le abilità ivi previste (Ascolto, Parlato/Interazione, Scrittura, Lettura);
   b) i docenti con competenze linguistiche certificate in relazione alle abilità di cui alla lettera a), di livello B2 del QCER, iscritti e frequentanti un corso di formazione per conseguire il livello C1 del QCER.

2. I docenti di cui al comma 1, lettera b), possono essere ammessi al colloquio finale di cui all'articolo 6, comma 1, previo conseguimento della certificazione di livello C1 del QCER.

3. Per gli anni scolastici 2011/12 e 2012/13, con riferimento a quanto previsto all'articolo 6, comma 2, del Regolamento emanato con Decreto del Presidente della Repubblica n. 89/2010, è considerato prioritario l'accesso ai corsi dei docenti di liceo linguistico e dei docenti in servizio presso istituzioni scolastiche ove sono attivati percorsi di liceo linguistico.

4. Ai fini di cui al presente articolo, i criteri di individuazione dei docenti destinatari dei corsi sono definiti dalle istituzioni scolastiche interessate, previa delibera dei competenti organi, anche attraverso eventuali accordi di rete tra le istituzioni medesime.

Art. 5
(Soggetti qualificati)

1. I corsi di perfezionamento sono realizzati da strutture universitarie in possesso dei requisiti di cui all'articolo 3, comma 3, del decreto del Ministro dell'Istruzione, dell'Università e della Ricerca 30 settembre 2011 (pubblicato nella G.U. n. 299 del 24 dicembre 2011), individuate attraverso appositi bandi emanati dall'ANSAS (ex INDIRE).

2. Gli Uffici Scolastici Regionali concorrono alla realizzazione dei corsi di perfezionamento di cui all'articolo 1, destinati ai soggetti di cui all'articolo 3, attraverso apposite convenzioni con le strutture universitarie in possesso dei requisiti di cui al comma 1, con il coinvolgimento delle istituzioni scolastiche del sistema nazionale di istruzione anche in rete tra loro, nei limiti delle risorse disponibili anche con il contributo di altri soggetti pubblici e privati interessati.

Art. 6
(Valutazione e titolo finale)

1. I corsi di cui all'articolo 1 si concludono con un esame finale, che consiste in un colloquio, condotto ai sensi dell'articolo 7 del decreto del Ministro dell'Istruzione, dell'Università e della Ricerca del 30 settembre 2011 (pubblicato nella G.U. n. 299 del 24 dicembre 2011), i cui esiti sono valutati in trentesimi.

2. I candidati accedono alla prova finale di cui al comma 1 se hanno conseguito valutazioni non inferiori a 18/30 in tutte le attività formative previste dai corsi di cui all'articolo 1.

3. Nelle more della definizione delle linee guida di cui all'articolo 10, comma 6 del decreto del Presidente della Repubblica 15 marzo 2010, n. 89, il titolo rilasciato al termine dei corsi di cui all'articolo 1 è requisito richiesto per impartire gli insegnamenti di cui all'articolo 6, comma 2 e all'articolo 10, comma 5, del decreto medesimo.

4. Ai docenti che hanno superato l'esame finale di cui al comma 1 è rilasciato un certificato di corso di perfezionamento con descrizione del percorso formativo seguito.

Roma, 16 Aprile 2012

IL DIRETTORE GENERALE
Luciano CHIAPPETTA

ALLEGATO A

Profilo del docente CLIL

Il profilo del docente CLIL è così caratterizzato in relazione agli ambiti linguistico, disciplinare e metodologico-didattico

Ambito linguistico: • ha una competenza di Livello C1 nella lingua straniera • ha competenze linguistiche adeguate alla gestione di materiali disciplinari in lingua straniera • ha una padronanza della microlingua disciplinare (lessico specifico, tipologie di discorso, generi e forme testuali,...) e sa trattare nozioni e concetti disciplinari in lingua straniera.
Ambito disciplinare: • è in grado di utilizzare i saperi disciplinari in coerenza con la dimensione formativa proposta dai curricula delle materie relative al proprio ordine di scuola • è in grado di trasporre in chiave didattica i saperi disciplinari integrando lingua e contenuti.
Ambito metodologico-didattico: • è in grado di progettare percorsi CLIL in sinergia con i docenti di lingua straniera e/o di altre discipline • è in grado di reperire, scegliere, adattare, creare materiali e risorse didattiche per ottimizzare la lezione CLIL, utilizzando anche le risorse tecnologiche e informatiche • è in grado di realizzare autonomamente un percorso CLIL, impiegando metodologie e strategie finalizzate a favorire l'apprendimento attraverso la lingua straniera • è in grado di elaborare e utilizzare sistemi e strumenti di valutazione condivisi e integrati, coerenti con la metodologia CLIL.

ALLEGATO B

Articolazione del corso di perfezionamento e Tabella dei crediti formativi universitari

Attività formative	**Ambito disciplinare**	**Settore scientifico-disciplinare (SSD)**	**Crediti Formativi Universitari (CFU)**
di base	Aspetti teorici e metodologici trasversali, come elementi di partenza per i laboratori previsti nelle attività formative caratterizzanti.	SSD L-LIN/02 e SSD L-LIN* di tutte le lingue purché vengano attivati insegnamenti di contenuto glottodidattico ** La sigla SSD L-LIN indica i Settori Scientifico-Disciplinari della lingua straniera prescelta per il corso di formazione*	9 CFU
caratterizzanti I CFU da acquisire in queste attività formative caratterizzanti avranno forma primariamente laboratoriale e dovranno portare ad una effettiva integrazione tra gli insegnamenti impartiti.	Didattiche disciplinari in prospettiva veicolare (CLIL)	SSD L-LIN/02 e SSD L – LIN * della lingua scelta SSD delle discipline da veicolare ** La sigla SSD L-LIN indica i Settori Scientifico-Disciplinari della lingua straniera prescelta per il corso di formazione.*	9 CFU delle discipline linguistiche di cui almeno 3 CFU in copresenza con le discipline da veicolare
Altre attività - tirocinio CLIL con modalità di ricerca-azione anche a distanza e colloquio finale.			2 CFU
Totale			**20 CFU**

Appendix 3

Italian legislation on CLIL (1999-2016)

1. MIUR (1999). *Regolamento recante norme in materia di autonomia delle istituzioni scolastiche, ai sensi dell'art. 21 della L. 15 marzo 1997, n. 59*. Available at http://archivio.pubblica.istruzione.it/didattica_museale/dpr275_1999.pdf (January, 2018).
2. MIUR (2010a). *Decreto del Presidente della Repubblica 15 marzo 2010, n. 89 Regolamento recante revisione dell'assetto ordinamentale, organizzativo e didattico dei licei a norma dell'articolo 64, comma 4, del decreto-legge 25 giugno 2008, n. 112, convertito, con modificazioni, dalla legge 6 agosto 2008, n. 133. (10G0111) (GU n. 137 del 15-6-2010 - Suppl. Ordinario n.128.*
3. MIUR (2010b). *DECRETO 10 settembre 2010, n. 249 Regolamento concernente: «Definizione della disciplina dei requisiti e delle modalità della formazione iniziale degli insegnanti della scuola dell'infanzia, della scuola primaria e della scuola secondaria di primo e secondo grado, ai sensi dell'articolo 2, comma 416, della legge 24 Dicembre 2007, n. 244*.
4. MIUR (2011). *Criteri e modalità per lo svolgimento dei corsi di perfezionamento per l'insegnamento di una disciplina, non linguistica, in lingua straniera nelle scuole, ai sensi dell'articolo 14 del decreto 10 settembre 2010, n. 249*. *Gazzetta Ufficiale della Repubblica Italiana*. *Serie generale n. 299. 24 Dicembre 2011. 2–13.*
5. MIUR (2012). *Il presente decreto definisce gli aspetti caratterizzanti dei corsi di perfezionamento per l'insegnamento di una disciplina non linguistica in lingua straniera, secondo la metodologia CLIL (Content and Language Integrated Learning), rivolti ai docenti in sevizio nei licei e negli istituti tecnici. I corsi di cui al comma 1 si configurano come corsi di formazione in servizio ai sensi degli articoli 63 3 63, commi 8 e 9, del CCNL del personale del comparto scuola 29 novembre 2007.*
6. MIUR (2013). *"Criteri e parametri per l'assegnazione diretta alle istituzioni*

scolastiche nonché per la determinazione delle misure nazionali relative la missione Istruzione Scolastica, a valere sul Fondo per il Funzionamento delle istituzioni scolastiche".

7. MIUR (2014). *Organizzazione e avvio dei corsi metodologico-didattici CIII di cui al DM 351/2014.*
8. MIUR (2015a). *Criteri e parametri per l'assegnazione diretta alle istituzioni scolastiche nonché per la determinazione delle misure nazionali relative la missione Istruzione Scolastica, a valere sul Fondo per il funzionamento delle istituzioni scolastiche*.
9. MIUR (2015b). *Organizzazione e avvio dei corsi linguistici per docenti CLIL di cui al DM 435/2015 e al Decreto del Direttore Generale per il personale scolastico del 5/8/2015 prot. N. 864.*
10. MIUR (2016). *Azioni a supporto della metodologia CLIL nei Licei linguistici*. Available at http://selda.unicatt.it/milanoUltima_versione_22_dicembre__2016.pdf (January, 2018).

Appendix 4

European Council and European Centre for Modern Languages (ECML) documents

1. European Council (1976). *Resolution of the Council and of the Ministers of Education, meeting with the Council – of 9 February 1976 - comprising an action programme in the field of education*, Official Journal No C 38/1.
2. European Council (1982). *Recommendation No. R (82) 18 of the Committee of Ministers to Member States Concerning Modern Languages*
3. European Council (1995). *White Paper on Education and Training: Teaching and Learning, Towards the Learning Society*. Available at http://europa.eu/documents/comm/white_papers/pdf/com95_590_en.pdf, p. 51 (January, 2018).
4. European Council (2000). *The Lisbon Special European Council (March 2000): Towards a Europe of Innovation and Knowledge*. Available at http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=URISERV:c10241&from=EN (January, 2018).
5. European Council (2003). *Promoting Language Learning and Linguistic Diversity: An Action Plan 2004-2006*. COM (2003) 449 nal. Brussels. 20 July 2003. Available at http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/ ?uri =CE LEX :52003 DC 0 449&from=EN (January, 2018).
6. European Council (2005). *A New Framework Strategy for Multilingualism*. Available at http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52005DC0596 (January, 2018).
7. European Council (2005b). The 2678th Council Meeting - General Affairs - gathered in Luxembourg, 3 October 2005. and External Relations. Available at http://europa.eu/rapid/press-release_PRES-05-241_en.htm (January, 2018).
8. ECML (2007), CLIL Matrix. Available at http://archive. ecml.at /mtp2 /CLIL matrix/EN/qMain.html (January, 2018).
9. European Council (2010a). *Europe 2020 in* Italy. Available at http://ec.europa.eu/europe2020/europe-2020-in-your-country/italia/country-specific-recommendations/index_en.htm (January, 2018).

10. European Council (2010b). *Europe 2020: A strategy for smart, sustainable and inclusive growth*. Brussels. Available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF (January, 2018).
11. European Commission (2012a). *Rethinking Education Strategy, Press release 20 November 2012*. Available at http://europa.eu/rapid/press-release_IP-12-1233_en.htm (January, 2018).
12. European Commission (2012b). *Eurobarometer Survey, Europeans and Their Languages*. Available at http://ec.europa.eu/languages/languages-of-europe/eurobarometersurvey_en.htm (January, 2018).
13. European Commission (2012c). *Rethinking Education: Investing in skills for better socio-economic outcomes*. COM (2012) 669 nal. Strasbourg. Strasbourg, 20.11.2012 Available at https://epthinktank.eu/2013/05/25/rethinking-education/ (January, 2018).
14. European Commission (2014). *Improving the effectiveness of language learning: CLIL and computer assisted language learning*, 25 June 2014. Available at http://ec.europa.eu/dgs/education_culture/repository/languages/library/studies/clil-call_en.pdf (January, 2018).
15. ECML (2007). *Research and Development - An introduction to the current European context in language teaching*, Available at http://citeseerx. ist.psu.edu / viewdoc/download?doi=10.1.1.118.6734&rep=rep1&type=pdf (January, 2018).
16. ECML (2012). *Literacies through content and language integrated learning: effective subjects and languages*. Available at http://pluriliteracies.ecml.at/en-us/Home/Project-information (January, 2018).
17. ECML (2016). 2016-2019: *Developing language awareness in subject classes*. Available at http://www.ecml.at/ECML-Programme/Programme2016-2019/ Languageofschooling/tabid/1854/Default.aspx (January, 2018).

Appendix 5:

Consent form for audio- recording

Liceo Statale _____

_____ Milano (MI)

Tel. _____ - Fax _____

E-mail _____ - PEC _____

P.IVA _____ - Cod. Mecc. _____

LIBERATORIA AUDIOREGISTRAZIONI

Milano, ...

Il/La sottoscritt.....

genitore dell'alunn..... della classe.....,

AUTORIZZA

l'utilizzo delle registrazioni audio del... propri.....figli... , realizzate all'interno dell'edificio scolastico nel corso della frequenza delle lezioni della prof. _____ , quasi esclusivamente il giovedì nel periodo Marzo-Giugno e per un numero non superiore alle 10 lezioni.

L'osservazione delle attività didattiche rientra in un percorso di Dottorato di ricerca-azione che il dott. Mencarelli sta seguendo presso l'Università degli Studi di Milano con supervisione della prof. Luciana Pedrazzini.

Si garantisce che tutti i dati raccolti saranno utilizzati solo al fine del progetto in questione e gestiti in modo riservato e autonomo.

Si ringrazia anticipatamente per la preziosa collaborazione dimostrata.

Firma del genitore .....

REFERENCES[6]

1. Allen, P., Swain, M., Harley, B. & Cummins, J. (1990). Aspects of classroom treatment: Toward a more comprehensive view of second language education. In B. Harley, P. Allen, P., J. Cummins, & M. Swain, (Eds.), *The development of bilingual proficiency* (pp. 57-81). Cambridge: Cambridge University Press.
2. Admiraal, W., Westhoff, G., de Bot, K. (2006). Evaluation of bilingual secondary education in The Netherlands: Students' language proficiency. *English Educational Research and Evaluation*, 12 (1), 75.
3. Badertscher, H., Bieri, T. (2009). *Wissenserwerb im Content and Language Integrated Learning: empirische Befunde und Interpretationen*. Bern-Stuttgart-Wien: Haupt.
4. Bertaux, P., Coonan, C. M., Frigols-Martín, M. J., & Mehisto, P. (2009). *The CLIL teacher's competences grid*. Common Constitution and Language Learning (CCLL) Comenius-Network. Available at http://www.istitutoinsolera.gov.it/doc/ Clil /The%20CLIL%20Teacher%27s%20Competences%20Grid.pdf (January, 2018).
5. Bonnet, A., Breidbach, S., Hallet, W. (2009). Fremdsprachlich handeln im Sachfach: Bilinguale Lernkontexte. In G. Bach, & J.-P. Timm (Eds.), *Englischunterricht* (pp. 172–198). Tübingen: Francke.
6. Bonnet, A., (2012). Towards an Evidence Base for CLIL: How to Integrate Qualitative and Quantitative as well as Process, Product and Participant Perspectives in CLIL Research. *International CLIL Research Journal*, 1 (4), 68.
7. Bruton, A. (2011). Is CLIL so beneficial, or just selective? Re-evaluating some of the Research. *System* 39 (4), 523-532. Available at https://www.unifg.it/sites/default/files/allegatiparagrafo/20-01-

[6]. Documents related to the Italian legislation (MIUR) are given in Appendix 3. Documents by EC and ECML in Appendix 4.

2014/bruton_is_ clil_so_beneficial_or_just_selective.pdf (January, 2018).

8. Casal, S. (2008). *Cooperative Learning in CLIL context: Ways to improve Students' Competences in the Foreign Language Classroom.* IAIE Conference: Cooperative Learning in Multicultural Societies: Critical reflections. Turin (Italy). Available at https://englishc1.files.wordpress.com/2010/04/turin _paper_casal.pdf (January, 2018).
9. Celce-Murcia, M., Larsen-Freeman D. (1999). *The Grammar Book: An ESL/EFL Teacher's Course*. Boston, MA: Heinle & Heinle.
10. Cenoz, J., Genesee, F., Gorter, D. (2013). Critical analysis of CLIL: taking stock and looking forward. *Applied Linguistics*, 35 (3), 243-262.
11. Cinganotto, L. (2013). *Aspetti linguistici e internazionali nell'apprendimento CLIL*. PhD thesis, Università Roma Tre.
12. Cinganotto, L. (2016). CLIL in Italy: A general overview. *Latin American Journal of Content and Language Integrated Learning*, 9 (2), 374-400.
13. CLIL Compendium: *Using Languages to Learn and Learning to use Languages* (2002). Available at http://www.clilcompendium.com (January, 2018).
14. *Common European Framework of Reference for Languages: Learning, Teaching, Assessment: Interactive version* (rev.2009). Available at http://www.coe.int/t/dg4/linguistic/Source/Framework_EN.pdf (January, 2018).
15. Coonan, C.M. (2012). Language issues in the Clil classroom: focus on the pupils. In L. Pedrazzini, & A. Nava (Eds.), *Learning and Teaching English: Insights from Reasearch* (pp. 279-235). Monza: Polimetrica International Scientific Publisher.
16. Coyle, D., Hood, P. & Marsh, D. (2010). *CLIL Content and Language Integrated* Learning. Cambridge: Cambridge University Press.
17. Dallinger, S., Jonkmann, K., Holl, J. & Fiege, C. (2015). The effect of content and language integrated learning on students' English and history competences - Killing two birds with one stone? *Learning and Instruction*, 41, 23-31.

18. Dalton-Puffer, C. (2007). *Discourse in Content and Language Integrated Learning (CLIL) Classrooms*. Amsterdam: John Benjamins Publishing Company.
19. Dalton-Puffer, C. (2008). Outcomes and processes in Content and Language Integrated Learning (CLIL): current research from Europe. In W. Delanoy & L. Volkman (Eds.), *Future Perspectives for English Language Teaching* (pp. 139-157). Heidelberg: Carl Winter.
20. Dalton-Puffer, C. (2011). Content and Language Integrated Learning: from practice to principles. *Annual review of Applied Linguistics*, 31, 182-204.
21. Dalton-Puffer, C. (2013). A construct of cognitive discourse functions for conceptualising content-language integration in CLIL and multilingual education. *European Journal of Applied Linguistics*, 1 (2), 216-253.
22. Dalton-Puffer, C., Smit, U. (2013). Content-and-language integrated learning: a research agenda. *Language Teaching*, 46 (4), 545-559.
23. Dalton-Puffer, C. (2015). *Policy and practice of CLIL in Europe and beyond*, CLIL Japan conference. Tokyo and Osaka (Japan) 21-22 February 2015. Available at http://www.cliljapan.org/2014/12/english-medium-instruction-multilingual-univers ity-settings-workshop-sophia-university-christiane-dalton-puffer/ (January, 2018).
24. Declerck, R., Reed, S. (2001). *Conditionals*. Berlin: Mouton de Gruyter.
25. Di Martino, E., Di Sabato, B. (2012). CLIL implementation in Italian schools: Can long-serving teachers be retrained effectively? The Italian protagonists' voice. *Latin American Journal of Content and Language Integrated Learning*, 5 (2), 73-105.
26. Echevarria, J. & Graves, A. (2007). *Sheltered Content Instruction: Teaching Students with Diverse Abilities.* Boston: Allyn & Bacon.
27. Escobar Urmeneta, C. (2013). Learning to become a CLIL teacher: teaching, reflection and professional development. *International Journal of Bilingual Education and Bilingualism*, 16 (3), 334-353.
28. EUCLID project consortium (2011). *The CLIL teacher profile.* Education and Culture DG.

29. Eurydice (2006). *Apprendimento integrato di lingua e contenuto (Content and Language Integrated Learning – CLIL) nella scuola in Europa.* Available at http://www.indire.it/lucabas/lkmw_file/eurydice/CLIL_EN.pdf (January,2018).
30. Eurydice/Eurostat (2012). *Le cifre chiave dell'insegnamento delle lingue a scuola in Europa*. Available at http://eacea.ec.europa.eu/education/eurydice (January, 2018).
31. Falk, L. M. (2008). *Svenska i engelskspråkig skolmiljö. Ämnesrelaterat språkbruk i två gymnasieklasser*. Acta Universitatis Stockholmiensis. Stockholm: Studies in Scandinavian Philology.
32. Ford, C. E., Thompson, S. A. (1986). Conditionals in discourse: A text-based study from English. In E.C. Traugott, A. Meulen, J.S. Reilly & C.A. Ferguson (Eds.), *On conditionals* (pp. 353-372). Cambridge: Cambridge University Press.
33. Gassner, D., Maillat, D. (2006). Spoken competence in CLIL: A pragmatica take on recent Swiss data. Special issue. *Vienna English Working Papers*, 13 (3), 15-22.
34. Hillyard, S. (2011). First steps in CLIL: Training the teachers. *Latin American Journal of Content & Language Integrated Learning*, 4 (2), 1-12.
35. Hwang, M. (1979). A Semantic and Syntactic Analysis of 'If' Conditionals. Unpublished M.A. thesis in TESL, UCLA.
36. Ioannou Georgiou, S. (2012). Reviewing the puzzle of CLIL. *ELT Journal*, 66 (4), 495-504.
37. Jäppinen, A.K. (2005). *Thinking and Content Learning of Mathematics and Science as Cognitional Development in Content and Language Integrated Learning (CLIL): Teaching Through a Foreign Language in Finland*. Available at http:// www.unifg .it/sites/default/files/allegatiparagrafo/20-01-2014/ jappinen. thinking_and_content_learning_in_mathematics_and_science.pdf (January, 2018).
38. Kidd, R. (1996). Teaching academic language functions at the secondary level. *Canadian Modern Language Review*, 52, 285-307.

39. Kiely, R. (2011). Understanding CLIL as an innovation. *Studies in Second Language Learning and Teaching*, 1(1), 153-171.
40. Krashen, S.D. (1985). *The Input Hypotheses: Issues and implications*. New York: Longman.
41. Kröss, L. (2014). *Cognitive Discourse functions in upper secondary CLIL Physics lessons*. M.A. thesis, University of Vienna, Austria.
42. Kuiken, F., van der Linden, E.H. (2013). Language policy and language education in the Netherlands. *Dutch Journal of Applied Linguistics*, 2 (2), 205-223.
43. Lackner, M. (2012). *The use of subject-related discourse functions in upper secondary CLIL History classes*. M.A. thesis, University of Vienna, Austria.
44. Langé, G. (2014). Le scelte Italiane. In G. Langé, & L. Cinganotto, (Eds.), *I Quaderni della Ricerca, E-CLIL per una didattica innovativa,* 18 (pp.12-24).
45. Lasagabaster, D. (2008). Foreign language competence in content and language integrated courses. *The Open Applied Linguistics Journal*, 1, 30-41.
46. Lasagabaster, D., Ruiz de Zarobe, Y. (2010). *CLIL in Spain: Implementation, results and teacher training*. Cambridge: Cambridge Scholars Publishing.
47. Lightbown, P. M., Spada, N. (2006). *How Languages are learned* (3rd ed.). Oxford: Oxford University Press.
48. Llinares, A., Morton, T., Whittaker, R. (2012). *The Roles of Language in CLIL*. Cambridge: Cambridge University Press.
49. Llinares, A., (2015). Integration in CLIL: a proposal to inform research and successful pedagogy. *Language, Culture and Curriculum*, 28 (1), 58-73.
50. Lorenzo, F., Casal, S., Moore, P. (2010). The effects of content and language integrated learning in European education: Key findings from the Andalusian bilingual sections evaluation project. *Applied Linguistics*, 31 (3), 418-442.
51. Lyster, R. (2007). *Learning and teaching languages through content: A counterbalanced approach.* Amsterdam: John Benjamins Publishing Company.
52. Mackey, A., Gass, S.M. (2005). *Second Language research: methodology and design*. New Jersey: Lawrence Eribaum Associates.

53. Marsh, D., Maljers, A., Hartiala, A. K. (2001). *Profiling European CLIL Classrooms: Languages Open Doors*. Jyväskylä: University of Jyväskylä.
54. Marsh, D., Frigols-Martin, M.J. (2007). CLIL as a catalyst for change in languages education. *Babylonia*, 3, 33-37.
55. Marsh, D., Mehisto, P., Wollf, D., & Frigols-Martìn, M.J. (2011), *European Framework for CLIL Teacher Education*, ECML. Available at http://clil-cd.ecml.at/EuropeanFrameworkforCLILTeacherEducation/tabid/2254/language/en-GB/Default.aspx (January, 2018).
56. Marsh, D., Pérez Canado M.L., Padilla J.R. (2015). *Clil in Action: Voices from the classroom*. Newcastle: Cambridge Scholars publishing.
57. Martìn del Pozo, M.A. (2015). The needs of a new EAP learner: CLIL lecturers. In P. Shrestha (Ed.), *Current Development in English for Academic and Specific Purposes: local innovations and global perspectives* (pp.115-138). Reading: Garnett Education.
58. Mehisto, P., Marsh, D., Frigols, M. (2008). *Uncovering CLIL: Content and language integrated learning in bilingual and multilingual education*. Oxford: Macmillan.
59. Meyer, O. et al. (2015). A pluriliteracies approach to content and language integrated learning – mapping learner progressions in knowledge construction and meaning-making, *Language, Culture and Curriculum*, 1, 28.
60. Moreno de Diezmas, E.N. (2016). The impact of CLIL on the acquisition of L2 competences and skills in primary education. *International Journal of English Studies*, 16 (2).
61. Netten, J., Spain, W. (1989). Student-teacher interaction patterns in the French immersion classroom: Implications for levels of achievement in French language proficiency. *The Canadian Modern Language Review*, 45, 485-501.
62. Nikula, T. (2007). Speaking English in Finnish content-based classrooms. *World Englishes*, 26 (2), 206-223.
63. Nikula, T., Dalton-Puffer, C., Llinares A. (2013). CLIL classroom discourse: Research from Europe. *Journal of Immersion and Content-Based Language Education*, 1 (1), 70-100.
64. O'Malley, J.M., Chamot, A.U. (1990). *Learning strategies in Second*

Language Acquisition. Cambridge: Cambridge University Press.

65. Olivares Leyva, M., Pena Diaz, C. (2013). How do we teach our CLIL teachers? A case Study from Alcalà Univeristy. *Porta Linguarum*, 19, 87-99.
66. Paran, A. (2013). Content and language integrated learning: Panacea or policy borrowing myth? *Applied Linguistics Review*, 4 (2), 317-342.
67. Parés Cortacans, E. (2013). *Speaking in the CLIL classroom. To what extent do teachers and students use English in the classroom?* M.A. thesis. Available at http://repositori.uvic.cat/bitstream/handle/10854/2542/trealu_a2013_pares_elvira_speaking.pdf?sequence=1 (January, 2018).
68. Perez Cañado, M.L. (2016). From the CLIL craze to the CLIL conundrum: addressing the current CLIL controversy. *Bellaterra Journal of Teaching & Learning Language & Literature*, 9 (1), 9-31.
69. Pokrivčáková, S. et al. (2015). *CLIL in Foreign Language Education: e-textbook for foreign language teachers*. Available at http://www.klis.pf.ukf.sk/dokumenty /CLIL/etextbook%20CLIL%20in%20FLE%20-%20final.pdf (June, 2016).
70. Ruiz de Zarobe, Y. (2008). CLIL and foreign language learning: A longitudinal study in the Basque Country. *International CLIL Research Journal*, 1 (1), 60-73.
71. Ruiz de Zarobe, Y. & Jiménez Catalan R.M. (2009). *Content and Language Integrated Learning. Evidence from Research in Europe*. Bristol: Multilingual Matter Ldt.
72. Ruiz de Zarobe, Y. (2011). Which language competencies benefit from CLIL? An insight into Applied Linguistics research. In Y. Ruiz de Zarobe, J.M. Sierra, & F. Gallardo del Puerto (Eds.), *Content and foreign language integrated learning. Contributions to multilingualism in European contexts* (pp. 129-154). Frankfurt-am-Main: Peter Lang.
73. Ruiz de Zarobe, Y. (2013). *CLIL Implementation: From Policy-Makers to Individual Initiatives*, *International Journal of Bilingual Education and Bilingualism*, 16 (3), 231-243.
74. Surmont, J., Struys, E., Van Den Noort, M., Van De Craen, P. (2013). The

effects of CLIL on mathematical content learning: A longitudinal study. *Studies in Second Language Learning and Teaching*, 6 (2), 319-337.

75. Swain, M. (2000). The output hypothesis and beyond: Mediating acquisition through collaborative dialogue. In J. Lantolf (Ed.), *Sociocultural theory and second language learning* (pp. 97-114). Oxford: Oxford University Press.
76. Swain, M., Lapkin, S. (2002). Talking it through: two French immersion learners' response to reformulation. *International Journal of Educational Research,* 37, 285-304.
77. Thomson, A.J., Martinet A.V. (1986). *A practical English Grammar*. Hong Kong: Oxford University Press.
78. Trim, J. (2007). *Modern languages in the Council of Europe 1954-1997: International co-operation in support of lifelong language learning for effective communication, mutual cultural enrichment and democratic citizenship in Europe*. Strasbourg: Council of Europe.
79. Van de Craen, P., Ceuleers, E., Mondt, K. (2007). Cognitive development and bilingualism in primary schools: Teaching maths in a CLIL environment. In D. Marsh, & D. Wolff (Eds.), *Diverse contexts – converging goals: CLIL in Europe* (pp. 185-200). Frankfurt am Main, Peter Lang.
80. Vollmer, H. J. (2010). *Items for a description of linguistic competence in the language of schooling necessary for learning/teaching sciences (at the end of compulsory education). An approach with reference points*. Strasbourg: Language Policy Division – Council of Europe. Available at https://www.coe.int/t/dg4/linguistic/Source/Source2010_ForumGeneva/1-LIS-sciences2010_EN.pdf (October, 2016).
81. Wolff, D. (2012). The European Framework for CLIL Teacher Education. *Synergies,* 8, 105-116.