

Universidad de Oviedo

Facultad de Formación del Profesorado y Educación

Trabajo Fin de Máster

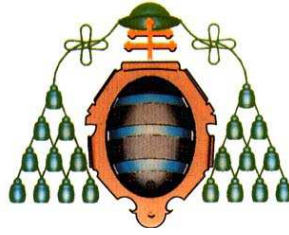
**Máster en Enseñanza Integrada de la Lengua Inglesa y
Contenidos: Educación Infantil y Primaria**

**Teaching Science in Primary Education following a
CLIL approach: The teaching practice in the 3rd cycle.**

Ester Martín Torrego

Tutor: José Miguel Arias Blanco

Febrero 2015



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*Language, learning and teaching are dynamic, fluid, mutable processes.
There is nothing fixed about them.*

(Larsen-Freeman 2000)

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1. INTRODUCTION.

The present project is an attempt to understand and discuss how the Content and Language Integrated Learning (CLIL) programme is implemented in the subject of Science in the primary education stage, and more specifically in the third cycle. In order to analyse this area, our study has focused on the pedagogical aspects some teachers base their teaching practice on and their opinion of the development of the programme from their experience. Therefore, a study has been carried out by analysing individual cases in some schools of Valladolid.

This introductory chapter will first justify the project explaining the choice of this master topic, followed by the presentation of the already material in existence as well as the importance of this matter nowadays. Finally, it will list the questions and objectives proposed to carry out the research.

1.1. PROJECT JUSTIFICATION.

There is been a growing interest in more communicative and contextualised ways to learn foreign languages in modern education within the last two decades. Globalization has been placing greater linguistic demands on mainstream education, from the early levels to universities. Therefore, in most countries in Europe there is a desire to learn languages in order to improve communication and competitiveness in this multicultural society.

Having a good command of foreign languages is especially important nowadays; many companies require language skills, and more and more often business takes place between countries and being able to communicate in the other language is crucial. The knowledge of other languages can open doors to get a better job and allows the communication with people from other countries and cultures.

In Spain, for example, nearly half of the population are not proficient in a foreign language, and people admit to find speaking the most difficult skill. The Ministerio de Educación, Cultura y Deporte (2013) shows that in 2011 only 26,7% of students ended secondary with a B1 level in the first foreign language, whereas the average in the European Union was 43,5%. Furthermore, Mejer, Boateng and Turchetti (2010) state that more than one-third of adults aged 25 to 64 in the European Union perceive that they do not know any foreign language. A small proportion says that they know one foreign language.

'There is broad consensus within the European Union that a delivery gap exists between what is provided as foreign language education, and outcomes in terms of learner performance. Targets for requisite foreign language competencies are not yet being reached. The importance of linguistic diversity in education and training in making Europe the most competitive and knowledge-based economy in the world, means that existing language barriers need to be lifted.' Marsh (2002, p 9)

Ana Halbach (2008) observed that European governments, in an attempt to promote foreign language learning, have implemented several initiatives, such as bilingual programmes, to reach this objective. Thus, students have the opportunity to be exposed to functional environments for language acquisition and learning. As adding extra time on the timetable was not viable, integrating language with non-language content, in a dual-focussed learning environment, emerged as a solution across Europe.

English is by far the foreign language most studied as a second language and also used in the CLIL approach. This idea is supported by Garfield (1989) and Krashen (2003), who considered English as the world's *lingua franca*. And Krashen (2003) added that 'it is difficult in today's world to be active and successful in international business, politics, scholarship or science without considerable competence in English'. The relevance of this language is due to the amount of people who use it on a daily basis. As David Graddol (2000, p 10) estimates, there are over 375 million English native speakers in the world, another 375 million speak it regularly as a second language, and about 750 million more people who speak English as a foreign language.

Nowadays languages have become so important that the CLIL approach is widespread in language teaching. This new perspective seems to be the most effective for learning languages because students are learning the language unconsciously. Furthermore, it is more attractive and motivating for the students because they are learning content facts.

However, this method should not only be beneficial for a better learning of languages; the contents of the subjects should be understood as well. CLIL has to allow children to have a normal development of their cognitive skills, whilst developing the key competences of the curriculum. These ideas were the starting point of this project.

Seeing that this method is being encouraged from a language perspective, this made me consider instead the CLIL method from the point of view of the content taught during the lesson and its level of accuracy.

As far as the existence of different subjects that can be chosen to be taught through a second language, this research mainly focus on Science, as it is considered a core subject in Primary Education. More specifically, this research deals with the third cycle as it is the one in which I have observed that both teachers and children find more difficulties in the achievement of objectives.

1.2. THE STATUS OF THE ISSUE.

Although there is a great deal of research on CLIL and its benefits for learning languages (e.g. Marsh, 2000; Krashen 2006) and cognitive processing (e.g. Cook 1997; Guerra 2007; Vázquez Carranza 2009; Ting 2010), little investigation is been carried out about the content acquisition in CLIL such as the study Anghel, Cabrales & Carro (2013) did or the initial concerns Rowe and Coonan (2008) had in relation to the language and content connection. However, some research is been done about the current situation of the development of the bilingual programmes and the first problems encountered (e.g. Rowe & Coonan 2008; Laorden Gutiérrez & Peñafiel Pedrosa 2010; Travé González 2013). These studies have been mostly done in specific autonomous regions, and the problems teacher face when implementing CLIL. Nevertheless, as the main purpose of this project is not on CLIL features but the pedagogical methodologies that teachers support their performance, we are going to focus on research related to it as, for instance, De Graaff, Koopman & Westhoff (2007) or Halbach (2008).

Nowadays there is a lot literature about the basis of bilingualism teaching and the way CLIL should be implemented. But, as is comprehensible, every teacher and centre will develop different strategies within their particular case. Teaching foreign languages in the context of a curricular subject was seen by teacher as a great advantage and, at the beginning, teachers and centres started teaching from *ad-hoc* initiatives, with no explicit methodologies (Bonnet et al. 2003, p 173 - cited in Halbach 2008, p 4) and designing their own materials. In an investigation carried out by Fernández Fernández et al. (2005), it was observed that teachers were highly motivated and this aspect helped on the implementation of bilingualism programmes although those teachers did not have much qualification or resources. Fernández Fernández et al. (2005, p 2) investigation reveals that teachers' motivation came from a need to value the English subject.

In relation to the bilingual programmes, Pavón Vázquez and Rubio (2010, p 45) pointed out that

“the implementation of content and language integrated learning (CLIL) means significant changes in the way in which teaching is planned, sequenced and carried out. The adoption of a new curriculum, which integrates linguistic and non-linguistic material, as well as the linguistic and methodological needs that come with the introduction of this type of teaching, have generated feelings of concern and uncertainty.”

The differences in the profiles that CLIL teachers can have vary because teaching a subject in a different language can be taught by a language teacher or a non-linguistic area teacher. In most cases, primary education teachers are able to teach in the target language because they are specialised in foreign language teaching. Meanwhile, in secondary and higher education, teachers are specialised in the content of the subjects rather than in the language. Sometimes, we can also find co-teaching where one content teacher and a language teacher work together.

A recent study (Anghel, Cabrales & Carro 2013) carried out in Madrid evaluated if the use of a foreign language in the teaching of other subjects can lead to a decrease in the learning of content. A standardised test¹ was taken by students in the 6th year of Primary Education consisting of three parts: Spanish language, mathematic and general knowledge. They concluded that, despite the fact that the first two exams remained similar to results of previous years; the third part showed significant negative ones, especially for students whose parents had not studied a degree at university (Anghel, Cabrales & Carro 2013, p 4).

1.3. INTEREST OF THE PROPOSAL.

As explained above, bilingual programmes have arisen from a linguistic development point of view. Stephen Krashen (2006, p 1) considers that ‘a primary goal of bilingual education is English language development’. Learning the language through the learning of content is motivating, pupils need the learning to decode information and use it in real situations.

Therefore, in contrast to the linguistic advantage, and related to the idea that pupils are taught specific knowledge in a foreign language, scepticism remains as to whether the acquisition of knowledge is similarly efficient, or if the use of a second language in the teaching of non-linguistic subject matters creates deficiencies in the students’ acquisition of curricular topics.

¹ El examen se llama CDI (prueba de Conocimientos y Destrezas Indispensables). Es un examen estandarizado que se ha hecho cada año en todos los colegios de primaria en la Comunidad de Madrid a los alumnos del sexto curso, empezando con el año académico 2004/05. Es obligatorio para todas las escuelas (públicas, privadas o concertadas). Este examen no tiene consecuencias académicas para el alumno, solamente pretende proporcionar información adicional para los profesores, padres y alumnos. (Anghel, Cabrales & Carro 2013, p 12).

This is probably also the main concern for the families when they have to decide whether their children should follow the bilingual programme or not. At the beginning, they are attracted by the improvement of a foreign language at the same time they are learning, seeing bilingualism as an extra point for their children education; but indeed they do not forget the main aim of teaching, which is that children develop competences and acquire the different conceptual knowledge necessary for their academic education. According to the Ministerio de Educación, Cultura y Deporte, (2004): Royal Decree 126/2014², in the article 13, schools are allowed to teach curricular subjects in a foreign language as far as they do not modify the basic curricular aspects, and try to foster students to acquire the specific terminologies in both languages.

The implementation of the bilingual programmes has been done gradually in Spain, and different methodologies and strategies teachers have been put into practice to apply a CLIL approach, as will be widely described in the theoretical framework of this project. However, in relation to the implication of the teacher, all of them have to 'set a challenge' and this dual-focussed approach 'requires teacher to change or reappraise consolidated practice' as Rowe and Coonan (2008, p 2) conveyed.

One of the most evident adjustments educators have done is related to the method and strategies, but that is not enough. Most bilingual teachers are language specialists, hence, when teachers face a science class they cannot forget that they have to update themselves in relation to the scientific method aspects as well. This is especially important in the third cycle of Primary Education, when contents become more demanding and difficult to comprehend for students. Science is an experimental and practical subject in which students should have to take an active role during the lesson to understand the world around them. In this sense, bilingual programmes 'implies not only linguistic knowledge but methodological, curricular and organizational adaptations' (Lova Mellado, Bolarín Martínez & Porto Currás 2013, p 257).

1.4. OBJECTIVES.

This present paper describes and analyses the importance of the content features in bilingual programmes, especially in Science, and how it has been developed in the schools during the last years. It presents the CLIL approach as the most recent teaching practise in foreign language teaching, and as a European initiative to facilitate communication between countries This is followed by a description

² *Royal Decree 126/2014*, 28th February 2014 establishes the **basic curriculum** for **Primary Education**.

of how it has been implemented both in Spain and the region of Castilla y León. Next, it is explained the relationship between content and language, the two parts of this dual-focused approach. Finally, this first part concludes with the teaching practice in Science, considering the different learning theories and Science curricular aspects.

The second part of this document is an investigation carried out to raise the pedagogical issues teachers bring to their lessons from the theoretical framework point of view and their opinion about the teaching in the higher years of primary education.

This project aims to answer the following research **questions**:

- What are the current practices of Science teachers and which methodological aspects do teachers base their teaching practice on?
- Which difficulties have teachers encountered in third cycle Science teaching?; What differences do they find in relation to the first and second cycles?

In order to answer these questions, this body of work has the **aims** listed below:

- To discuss the methodologies teachers put into practice in bilingual contexts.
- To analyse what teachers have had to modify to teach Science.
- To examine the main problems of the teaching and learning in the third cycle.

To answer these questions and reach the objectives, data will be collected from surveys and interviews to several teachers of primary education.

During the research teachers will evaluate the bilingual programme and the way they put it into practice in their school in Science. Probably, there will be a range of opinions on the matter, as every teacher has their own background and training. It is furthermore predictable that most teachers will be language specialists that have had to update, and may have attended CLIL methodology courses. Although the programme has been already developed for some years in their schools, they might still find problems. These problems will likely be related to content development, coordination with the rest of teachers, especially English if the teacher is not the same for both Science and English subjects, timing and resources available.

2. THEORETICAL FRAMEWORK.

As Christiane Dalton-Puffer (2007, p 2) points out, bilingual education, despite being a recent trend (as it is particularly visible since the early 1990's), is not a completely new phenomenon. In fact, its longstanding tradition can be traced back to the middle ages, when Latin was used as a medium of instruction. In the nineteenth century, however, in the state-financed formal schools there was a strong orientation towards monolingual education as Dalton-Puffer (2007, p 1) explain. This tradition continued after World War II throughout the Cold War. The fall of the Berlin Wall (9th November 1989), however, radically changed the world community. And, over the last twenty years, European policies towards cooperation as well as globalization and growing mobility in a larger context, have increased the demand for people who are able to communicate in international contexts.

In relation to the research, in the attempt to know the teaching practice, it will be discussed the methodology of Content and Language Integrated Learning (CLIL), which arose in Europe to foster foreign languages leaning. However, there is not just one methodology that describes this approach but many, as CLIL is regarded as an ***umbrella term***.

CLIL is an umbrella term covering a dozen or more educational approaches such as language showers, CLIL camps, student exchanges, local projects, international projects, family stays, modules, work-study abroad, one or more subjects, partial immersion, total immersion, two-way immersion, and double immersion. What is new about CLIL is that it synthesised and provides a flexible way of applying the knowledge learnt from these various approaches. Mehisto, Marsh & Frigols (2008, pp 12-13).

Therefore, the first part will refer to the great deal of previous methods, techniques and principles in second language teaching, as the CLIL approach is a result of linguistic teaching and learning development. But also, as will be explained later on, CLIL is a dual-focused approach and so we must teach content but the foreign language too.

2.1. FOREIGN LANGUAGE TEACHING.

Teaching and learning a foreign language is compulsory in Spain for primary students as established in the article 18 of the Organic Law for the Improvement of Education Standards LOMCE 8/2013, 9th December, which modified the Organic Law

of Education LOE 2/2006, 3rd May. It emphasised the necessity to open our educational system to the outside world by improving the learning of foreign languages to promote the mobility and exchanges to other countries in order to reinforce a **European cooperation**. In the annex 1 of the MECED (2014): Royal Decree 126/2014, in relation to the first foreign language subject, the importance of learning a foreign language nowadays is highlighted as a requirement for individuals living in a multicultural and multilingual context.

The LOMCE (2013, p 97865) also mentions as a priority the mastery of a second or even a third language so as to catch up the linguistic levels that globalization demands. This law, following the European Union aims, supports multilingualism and so redoubles their efforts in order to increase first language competence and offer a first approach to other languages too.

2.1.1. Language Teaching Methods.

Languages have been taught and learnt in many different ways as every teacher has their own ideas and understanding of what teaching should be like. And, although we know that teachers come to teaching with ideas about the teaching-learning process formed from their own student experience (Lortie 1975), Diane Larsen-Freeman (2000, p ix) claims that a study of methods is invaluable in teacher education because of five main reasons which are briefly described here:

- ✦ Methods serve as a foil for reflexion that can aid teachers in bringing to conscious awareness the thinking that underlies their actions. Thus, they can become clearer about why they do what they do.
- ✦ Teachers can decide the methods they feel more attractive to and resist the imposition of a particular one.
- ✦ Comprehension of methods is part of the knowledge base of teaching, allowing instructors use a professional discourse and connect teachers with others so as not to be isolated in their practice.
- ✦ This professional discourse may challenge teachers' conceptions of how teaching leads to learning.
- ✦ This understanding helps expand educators' repertoire of techniques and prevent them from becoming stale and 'overly routinised' (Prabhu 1990).

Lara Garrido (2009, p 1) noted that, 'in order to teach English effectively, EFL³ teachers must subscribe to one (or more) of the current approaches to teaching a foreign language and incorporate its language-learning strategies and techniques'. Then, that approach or method 'is shaped by the teachers' own understanding, beliefs, style and level of experience' (Larsen-Freeman 2000, p x).

Before analysing the different attempts in FLT⁴, the terms *approach*, *method* and *technique*, are explained before, as they are often named without distinction. It was Edward M. Anthony (1963) who identified these terms as three levels of conceptualization and organization for teaching a language. For him, the arrangement of these concepts is hierarchical, and so the organizational key is that techniques carry out a method which is consistent with an approach. A short adaptation of the definitions given by Anthony (1963) is presented here:

- ✦ **Approach** (why) is the level at which assumptions of the subject matter and beliefs about language and language learning are specified. The approach is an idea or theory.
- ✦ **Method** (how) is the level at which theory is put into practice and at which choices are made about the particular skills to be taught: An approach is axiomatic, a method is procedural. Within one approach, there can be many methods; and a method a set of techniques used in a systematic way.
- ✦ **Techniques** (what) is the level at which classroom procedures are described. It is a particular trick, stratagem, or contrivance used to accomplish an immediate objective. Techniques depend on the teacher, his individual artistry, and on the composition of the class.

There are several methods which have outlined the history of FLT methodology through the years. First attempts based their learning in grammar and reading of texts, in the later part of the 20th century, second language acquisition experiences influenced foreign language learning, leading to more communicative approaches.

At this point the main features of each method are detailed as they will be helpful to carry out the research and so recognise the thought that guide teachers' actions. The selected methods are based on Diane Larsen-Freeman (2000) as she has set links between principles and certain techniques and procedures observed in the classroom. A summary table (own elaboration) can be found in the annex 1.

³ EFL: English as a Foreign Language.

⁴ FLT: Foreign Language Teaching.

The Grammar Translation Method

This method was first used in teaching Latin and Greek, and dominated Europe from 1840s to 1940s. The main goal is on reading and writing, with little attention paid to communication and pronunciation. Students early begin reading difficult texts with an important focus on translating. Vocabulary is taught in the form of isolated word lists and explicit grammar rules are provided (deductively). The students' mother tongue is the medium of instruction. Larsen-Freeman (2000, pp 11-22)

The Direct Method

This was a reaction against the previous method, and translation was not allowed. It became established towards the end of the 19th century. The goal is on communication. Vocabulary is acquired in environmental contexts, more naturally, and in full sentences. Meaning is to be conveyed directly in the target language through the use of demonstration and visual aids, with no recourse to the students' native language; they make use of *realia*⁵, pictures or pantomime. Grammar is taught from the practice and experience (inductively). Larsen-Freeman (2000, pp 23-33)

The Audio-Lingual Method

It was used first by the ASTP⁶ and widespread in the 1960s. It is based on the principles of behaviourist learning theory and adapted many of the principles and procedures of the Direct Method. Language learning is habit formation and practice makes perfect, so the method fosters memorization of set phrases and overlearning through repetitive drills. Grammar is taught inductively. The goal is on oral fluency, and reading and writing learning is based on what students have already learned to say orally. There is abundant use of language laboratories, tapes and visual aids. Great importance is given to precise native-like pronunciation, and errors are to be avoided at all costs. Larsen-Freeman (2000, pp 35-51)

The Silent Way

This method was proposed by Gattegno. It consists on using a set of **colored rods** and **verbal commands** that leads to generate a serious gamelike situation in which the rules are implicitly agreed upon by giving meaning to the **gestures** and mime of the teacher. The teacher sets up simple linguistic situations for the learners to work on structures of the language, describing objects and actions. Silence removes the

⁵ The use of *realia* in the classroom means using objects or artefacts from **real life**.

⁶ Army Specialised Training Program (ASTP): they developed the Audio-lingual method in an attempt to train soldiers to act as spies during the Second World War.

teacher from the centre of attention and helps students develop independence. The use of the students' native language will be avoided and errors are seen as part of the learning process. Larsen-Freeman (2000, pp 53-72)

Desuggestopedia

This method was devised by Georgi Lozanov. It is based on the idea that students naturally set up psychological barriers (fears) to learning and that their brain could process and retain much more material if given "optimal" conditions for learning. Therefore, the teacher "desuggests" these limitations they think they have, using mental powers and providing a relaxed state of mind. It is characterised by the use of soft comfortable chairs, dim lighting and baroque music to allow concentration and facilitate the intake and retention of material. Students study and memorise dialogues and vocabulary, working on writing before speaking. The teacher tries to eliminate the barrier to learning being communicative. Larsen-Freeman (2000, pp 73-87)

Community Language Learning (CLL),

The following method was originated by Charles A. Curran. It was based on communication and confidence with and among students by using counselling techniques (teacher as a counsellor, student as client) and eliminating the peculiar threats pupils encounter in learning a foreign language. There is no prepared material, and learning starts from the students' linguistic confusion and conflict; thus the teacher gives support, looking for independent learners. As Rardin et al. (1988) observed, 'the CLL method is student-teacher-centered with both being decision-makers in the class'. A spirit of cooperation and security reduces anxiety. This security is enhanced by using the students' native language. Larsen-Freeman (2000, pp 89-106)

Total Physical Response (TPR)

The TPR method was defined by James J. Asher. It stressed the importance of comprehension before producing. After the learners internalise an extensive map of how the target language works, speaking will appear spontaneously when they are ready. Learning is around actions that students make after the instructor has given simple commands such as *sit*, *stop*, *stand*. As language is exposed at a rapid rate, students have a feeling of success and the affective filter is low. All these lead a high degree of motivation. Larsen-Freeman (2000, pp 107-119)

✚ The Silent Way, Desuggestopedia, Community Language Learning and Total Physical Response are affective humanistic approaches as there is respect for the students' feelings (Celce, Murcia 1991). They foster an active student involvement in learning and a student-centred learning.

Communicative Language Teaching (CLT)

It applies the theoretical perspective of the communicative approach (Widdowson, 1990), which is a reaction against methods that stressed the teaching of grammatical forms and paid little attention to the way language is used in everyday situations. This method is focused on the development of communicative competence. Teaching students how to use the language is considered to be as important as learning the language itself. It focuses on fluency, not just accuracy, and on lifelong language learning. The students are exposed to authentic language using it in real context. Grammar and vocabulary follow from the situational context and the roles of the interlocutors. Larsen-Freeman (2000, pp 121-136)

Content-based approach (CBA) - Content and Language Integrated Learning (CLIL)⁷

These approaches integrate the learning of languages with the learning of academic subject matter. These subjects provide natural content for language instruction, instead of sorting out sounds or grammar structures. In order to understand subject matter texts, there must be clear language objectives as well as content learning objectives. The teacher 'scaffolds' the linguistic content helping students to build together complete utterances. Learners work with meaningful, cognitively demanding language and content within the context of authentic material and tasks. They do not only communicate but read, discuss and write about content. Larsen-Freeman (2000, pp 137-143)

The CLIL approach seems to be one of the most effective and used in European schools for learning languages nowadays. As it is described by Erurydice (2012, p 10), in most European countries (apart from Denmark, Greece, Iceland and Turkey), there are schools that give students the opportunity to follow a CLIL learning approach.

⁷ Diane Larsen-Freeman (2000, p 137) does not mention the term "CLIL", although she defines CBA as an integration of the learning of language with the learning of some other content, often academic subject matter. However, Tarnopolsky (2013, p 1), in an attempt to find the differences, denotes that both are considered as practically identical methods, with CLIL being broader in scope. Besides, Coyle, Hood & Marsh (2010, p 1) explained that, although they share basic theories, they are not synonymous.

As aforementioned, CLIL is an *umbrella term* which includes many different methods. Larsen-Freeman (2000, p 138) remarks that:

Because the language objectives are dictated by the texts, content-based instruction rightfully fits in with the other methods [the ones explained above] and sequence of language items arise from communicative needs, not predetermined syllabi.

Furthermore, we do not have to forget that schools in Spain do not only teach English in bilingual classes as there is still a subject for the English language. And, according to the current legislation, especially the curriculum for primary education (Royal Decree 126/2014), the area of foreign languages prescribes that the approach to be used should be a communicative one (Communicative Language Teaching method).

2.2. CONTENT AND LANGUAGE INTEGRATED LEARNING (CLIL).

Following Coyle, Hood & Marsh (2010, p 1), CLIL is content-driven, and this is where it extends the experience of learning a language, and where it becomes different to existing language-teaching approaches.

2.2.1. Definition and main characteristics.

In order to make the first move, a clear and general definition of the concept of CLIL is presented below:

Content and Language Integrated Learning (CLIL) is a dual-focussed educational approach in which an additional language is used for the learning and teaching of both content and language (Coyle, Hood & Marsh 2010, p 1; Mehisto, Marsh & Frigols 2008, p 9). It encourages independent and co-operative learning, while building common purpose and forums for lifelong development (Mehisto, Marsh & Frigols 2008, p 7).

Lessow-Hurley (2000) pointed the following **basis of CLIL**:

- The foreign language is used as a vehicle for accessing information.
- The foreign language is used for instruction and communication.
- Learning the language and learning content are part of the same process.
- Emphasises the promotion of additive bilingualism⁸.

⁸ Additive bilingualism: When learning a second language does not interfere with the learning of a first language. English and the native language receive some balanced level of use in core curricular instruction.

- The development of cognitive flexibility and reflection upon the linguistic and communicative functioning of both languages is key.

Regarding the development of the CLIL approach, a lesson will be based on communication, cooperation and work in groups and doing problem-solving tasks. This way of working allows students to develop self-confidence and enhances academic cognitive processes as well as communication skills. All those aspects are connected with a constructivist approach, as the idea is pupils construct their own learning and be aware of their knowledge through experiencing and reflecting on those experiences; making hypotheses and drawing conclusions from their findings. Therefore, the CLIL approach requires a greater degree of participation from the learners in the teaching-learning process.

Coyle, Hood, and Marsh (2010, p 41) synthesised this methodological approach in four elements known as **the 4Cs** (figure 1), where *culture* (development of intercultural understanding and global citizenship) is the underlying concept for the other three aspects: *content* (subject matter), *communication* (language learning and using) and *cognition* (learning and thinking processes). Besides, these four elements have to be surrounded by specific *contexts*.

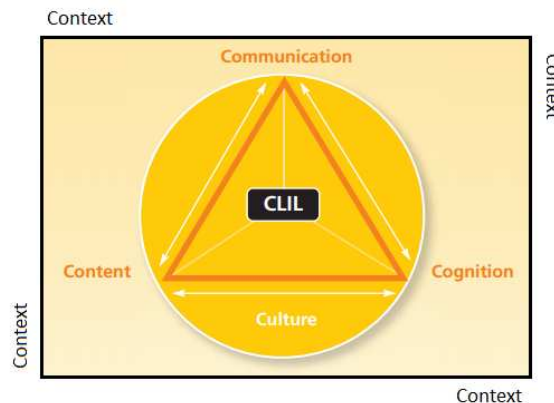


Figure 1. The 4Cs Framework. (Coyle, Hood & Marsh 2010, p 41)

The amount of hours students have a week of CLIL instruction might vary in every school, and in every class. Sometimes it can be only 20-30 minutes of *language showers*⁹ per week, in which students sing songs or play games in the target language. Also, the time students are exposed to the second language will depend on the teacher. There are different types of CLIL programmes depending on the time students are

⁹ *Language showers*: regular, short, continuous exposure to CLIL delivered in the target language for 15 or 30 minutes several times a week. They are often associated with Primary schools and are usually taught in one subject area. (University of Cambridge 2009, p 3)

exposed to CLIL (the percentage of CLIL teaching in a curriculum); it can be *low* (5-15%), *medium* (15-50%) or *high* (50%+).

An intensive use of the foreign language as the language of instruction is very effective for the development of communicative competence (Brinton, Snow & Wesche 1989). And although students' communication will be reduced at the beginning and they will need more time, they are acquiring the language rather than just learning it, therefore, the process is subconscious and more lasting.

Mehisto, Marsh and Frigols (2008, p 12) listed the achievements of the CLIL programmes as described here:

- 1) grade-appropriate levels of academic achievement in subjects taught through the CLIL language;
- 2) grade-appropriate functional proficiency in listening, speaking, reading and writing in the CLIL language;
- 3) grade-appropriate levels of first-language competence in listening, speaking, reading and writing;
- 4) an understanding and appreciation of the cultures associated with the CLIL language and the student's first language;
- 5) the cognitive and social skills and habits required for success in an ever-changing world.

2.2.2. Implementation of CLIL in Spain.

The development of the bilingual programmes is one of the most important innovations Spain has developed for the last years. We observe that many schools offer bilingualism nowadays and that families require them.

The first step in the implementation of CLIL in Spain was in 1996 (1st February), when the British Council and the Spanish Ministry of Education and Science, signed an agreement with the objective to develop, in state schools, a bilingual programme which is developed through an English and Spanish integrated curriculum, which would allow students to access, when they finish secondary education, to the education in any of both countries. This project began in 43 schools with 1200 students of Infant education (Dobson, Murillo & Johnstone 2010, p 5). The students who are involved in this programme are exposed to English between 8 and 10 hours a week. Children are taught English as a foreign language, Science in English and a third subject that depends on the availability of specialists able to teach their subject in English. They follow the *Synthetic Phonics* approach in pre-school stage and *literacy* in all the following years. The teachers taking part are specialists in English as a foreign language or native speakers who help to provide their knowledge about the *National Curriculum*.

According to the evaluation report carried out by the Ministry of Education and the British Council (Dobson, Murillo & Johnstone 2010, p 7), in 2010 there were 200,000 students involved in bilingual education, either with the British Council programme or the regional government versions of CLIL.

Bilingual programmes have been adapted for all age groups. In Spain, CLIL has been developed in pre-school education, primary education, secondary and at university levels. In primary education it has been implemented in subjects like Science, Art, Physical Education or Music. Spanish and Mathematics are excluded to be taught in a foreign language though.

The new educational law, LOMCE, has divided the subject of Science into two: Natural science and Social science; most schools have decided to leave the social area to be taught in Spanish and continue the bilingualism only in Natural science.

The bilingual programmes have been developed from every autonomous region; this is why the next section explains in more detail how the bilingual programmes have been developed in Castilla y León and what are its requirements.

2.2.3. CLIL in Castilla y León.

In the region of Castilla y León, a foreign language (English in most cases), is offered since the early years foundation stage in all state schools. It has promoted bilingual education in Spanish-English, in Spanish-French and there is even one school that offers Spanish-German. Besides, a second language is provided too, it can be either French or German in Primary Education.

As it is explained in Educacyl, the regional educational webpage¹⁰, the first schools with the British Council Programme began in the school year 1996/97, and are a total of 19 primary schools nowadays and 18 of secondary education. The first schools that implemented bilingual schools did it in 2006/2007. Today the region counts with a total number of 28 state schools, 12 state high schools and 41 semi-private schools under the bilingualism programme.

The Regional Ministry of Education establishes, in the ORDER EDU/6/2006¹¹, 4th January, that in order to carry out bilingual sections, **schools** will:

- Use a foreign language in order to teach non-linguistic subjects.

¹⁰ <http://www.educa.jcyl.es/es/temas/idiomas-bilinguismo/programas-bilingues-secciones-linguisticas>

¹¹ ORDER EDU/6/2006, 4th January, regulates the establishment of the **bilingual sections** in all centres supported with public funds in the community of Castilla y León. This order was modified by ORDER/EDU/392/2012, 30th May.

- Initiate the educational offer in the first year of the educational stage (either Primary or Secondary).
- Involve a minimum of two non-linguistic areas and a maximum of three, not exceeding the 50% of the total amount of hours of the students.
- Make use of English, French, German, Italian or Portuguese language.
- Modify the timetable, if necessary, adding extra hour for language teaching extending until 27 hours per week in Primary Education and 32 in Secondary Education.
- Establish the same ratio as the general one for that educational level.
- Evaluate students in accordance with the current regulations.

Regarding the requirements for the **teachers** involved in the bilingual sections, they are the following:

- Non-linguistic areas teaching staff must show adequate knowledge of the second language.
- Achieve, at least, a B2 CEFR¹² level for teaching in Primary Education.

2.3. RELATIONSHIP BETWEEN CONTENT AND LANGUAGE.

Student cannot develop academic knowledge and skills without access to the language in which that knowledge is embedded, discussed, constructed, or evaluated. Nor can they acquire academic language skills in a context devoid of [academic] content. (Crandall 1994, p 256, quoted in Coyle, Hood & Marsh 2010, p 41).

Integrating content and language learning is not about 'translating' first language subject into the target language in the hope that learners will understand in the same way as their mother tongue. Therefore it is not a matter of simply changing the language of instruction.

Teaching a subject through this approach requires some changes in the curricula such as planning, organization and the methodology used. These non-linguistic

¹² Common European Framework of Reference for Languages: Learning, teaching, assessment (CEFR) provides a common basis for the elaboration of language syllabuses, curriculum guidelines, examinations, textbooks, etc. across Europe. It also defines levels of proficiency which allow learners' progress to be measured at each stage of learning and on a life-long basis. (Council of Europe, 2001 p 1). There are six levels: A1 and A2 (basic user), B1 and B2 (independent user), C1 and C2 (proficient user). (Council of Europe, 2001 p 23)

subjects will have to integrate linguistic areas on the syllabus and considered for the assessment.

2.3.1. Content learning and language learning.

Theoretically, CLIL connects content learning and language learning so as to reach a *synergy* where the whole is greater than the sum of its parts, as Coyle, Hood and Marsh (2010, p 27) prompt. Thus, at this point both parts will be treated separately so as to understand their relationship.

Content learning

The concept of what constitutes content in a CLIL context is much more flexible than a subject of a traditional school curriculum. CLIL programmes will have to adapt to the contextual variables of the learning environment such as teacher availability, language support, age of learners and the social demands. And will offer the opportunity to be more content-led, more language-led or both.

Learning content is often based on the aims of a syllabus; however, choosing an effective pedagogy is important as well. A 'banking model' of learning (expert who deposits information and skills into the memory bank of the learner) should be rejected, and a social-constructivist approach (active and student-centred learning) is more appropriated.

Students must be cognitively engaged, they have to be involved and aware of their own learning developing metacognitive skills such as 'learning to learn'. Lessons will be interactive doing group work, student questioning and problem solving. Therefore, students do not only need a knowledge base but also know how to apply it, how to think and reason and respond creatively.

If learning is to be retained and to be readily for use, then learners must make their own construction of knowledge – make it their own – and must learn to take responsibility for the management of their own learning. (Nisbet 1991, p 28 - cited in Coyle, Hood & Marsh 2010, p 30)

Learners have to face a range of thinking and problem-thinking skills, identifying different cognitive and knowledge processes associated with the CLIL content. Anderson and Krathwohl (2001, p 67-8 - cited in Coyle, Hood & Marsh 2010, p 31), revise Bloom's taxonomy and present a transparent connection of thinking processes to knowledge construction. As observed in this revision (annex 2), the cognitive process dimension consists of lower-order thinking (remembering, understanding and

applying) and high-order thinking (analysis, evaluating and creating), both of which are integral to effective learning. And they add a 'knowledge dimension' which provides a framework for exploring the demands of different types of knowledge: conceptual, procedural and metacognitive.

Language learning

As explained above in the section 2.1., foreign languages have been taught in different ways, from the more traditional grammatical ones to the current communicative practices. But in CLIL, language must be taught in integration with the content of the subject. Although there is some tension, in relation to how language should be taught, between a focus on form (grammar) and/or focusing on meaning. Savignon (2004), for example, considers language using in communication and interaction over a focus on grammar.

Language in CLIL is used to learn content, but Coyle, Hood & Marsh (2010, p 33) question if teachers know *how* to use it. Because language is part of the process of learning in the non-linguistic subject, language learning cannot be ignored. When teaching and learning a language, the progression of grammar is similar; but in a CLIL context, the language does not have to follow the same pattern. For instance, in subjects like Science students will need the language to construct their meanings in interactive activities so they need proper language support which allows them to success and achieve the content objectives.

Therefore, CILL lessons, although will be normally content-led, language should be adapted to the students' English level and fostering the learning of it.

2.4. TEACHING SCIENCE IN PRIMARY EDUCATION USING CLIL.

As aforementioned, schools can choose the areas in which to develop the bilingual programme. Because of the nature of the subject, Science is in most cases the first option. This chapter will deal first with a general meaning of teaching and then on teaching regarding CLIL practices. Finally it will be discussed in the following points the meaning of the area of science in Primary Education.

2.4.1. Teaching and learning process.

'**Learning** is a much more complex and drawn out process than generally acknowledged' (Schuell 1990, p 531). This author is of the opinion that 'the nature of the learning process changes as the task of mastering a complex body of knowledge unfolds', i. e. that the way we learn will evolve and depend on the development of the learning and its context. In order to promote meaningful learning, he claims that learners pass through a series of phases, which go from isolated and memorisable ideas of the unknown knowledge to the understanding and automation of them.

Thus, teachers have to reflect on the best way to teach depending on the needs and the stage of learning of the students, because as Schuell (1990, p 534) states,

'The teaching methods employed, as well as the content, should be appropriate for the phase of learning in which the students are engaged. For example, one would teach differently if a new topical area is just being introduced than if the students had already gained some proficiency in the domain. Thus, introductory courses should be taught differently from more advanced courses—at least in part—but, in more instances than not, introductory and advance courses in a particular content area are taught in basically the same way.'

There are different theories which describe learning. For the purpose of this paper only a few of them are described. It is important to note, however, that the following approaches do not exclude each other, but rather complement one another.

Behaviourism

It is concerned with the skills and conditions of learning. According to Eggen and Kauchak (2001, p 214), learning is 'a permanent change in observable behaviour which occurs as a result of experience'. Therefore learning can be seen as an outcome or the end product of a process. Practice seems necessary to automatise patterns of behaviour. Behaviourists view the learner as a passive person who responds to environmental stimuli and whose behaviour is shaped by the reinforcement. One example of this view of learning is practice and drill; pupils learn the pronunciation of words. The teacher pronounces words correctly and pupils have to repeat them. Learning is therefore defined as a change in the behaviour of the learner. Contributors of this view are Pavlov or Skinner.

Cognitivism

This was a response to behaviourism and became the more dominant approach in the late 20th century. It was argued that not all learning occurs through shaping and

changing of behaviours. Ertmer and Newby (1993, p 51) consider that 'cognitive theories stress the acquisition of knowledge and internal mental structures'. They also mention a 'focus on conceptualization of students' learning processes' such as thinking, memory, knowing and problem solving. And finally they point out how this theory 'addresses the issues of how information is received, organised, stored and retrieved by the mind'. Learners are active participants in their learning, and the mind functions like a computer processor: information comes in, is being processed and leads to certain outcomes. The cognitive view of learning is teacher-centred, and information must be presented in an organised manner in order to achieve the most efficient learning. Ertmer and Newby (1993, p 53) make reference to the importance of relating new information to existing knowledge in a meaningful way.

Constructivism

Constructivism is a philosophy of learning founded on the premise that, by reflecting on experiences, 'learners construct their own understanding of the outside world. This idea is opposite to cognitivism, how Ertmer and Newby (1993, p 55) state, 'humans *create* meaning, not *acquire* it'. (Stavredes, 2011) add that learners 'give meaning to the new information using their own prior attitudes, beliefs, and experiences as references'. Learning, therefore, is simply the process of adjusting our mental models to accommodate new experiences. Learners are better involved in meaningful contexts doing authentic tasks. They are active participants in the construction of knowledge while the instructor serves as a facilitator. The idea of guiding students in the constructions of their knowledge has roots in classical antiquity.

Two types of constructivism emerged beginning in the late 1970s. Lev Vygotsky introduced social constructivism, in which social interaction with others helps the learner put meaning to information. Vygotsky noted a Zone of Proximal Development in which learners can develop a certain level of meaning on their own but can grow even greater after interacting with classmates and instructors. In 1985, Jean Piaget introduced cognitive constructivism, in which knowledge is constructed by either assimilation or accommodation.

Science teaching and learning in primary education is based nowadays on a constructivism model. This means that teachers start from the students' previous knowledge and base their learning on experience and observation, doing hands-on problem solving. Educators will focus on making connections between facts and fostering new understanding in students. Teachers also rely heavily on open-ended questions and promote extensive dialogue among students. Constructivism, in relation

to assessment, calls for the elimination of grades and standardised testing. Instead, assessment becomes part of the learning process so that students play a larger role in judging their own progress.

In their updated paper, Ertmer and Newby (2013) make reference to the new learning preferences today. For them,

'the ability to access people and information has changed the way people learn...know-how and know-what is being supplemented with know-where (the understanding of where to find knowledge needed). Ertmer and Newby (2013, p 66)

Learners are surrounded by all kind of technology nowadays and have immediate access to the information. They are used to learning in their group of peers and in conversation, using images, videos and multimedia, and are able to deal with multitasking. Ertmer and Newby (2013) comprise the 21st-century skills in problem solving and collaborative work. Therefore, if learners' learning has changed, teachers have to adapt their teaching to that.

2.4.2. CLIL Teaching.

Although the CLIL approach has been encouraged from a linguistic learning point of view, non-linguistic subjects have also been benefited as students are taught in a foreign language and this makes students to develop some competences in order to cope with learning in a foreign language. Marsh and Hartiala (2001, p 16) point out several reasons for introducing CLIL regarding content and learning¹³.

Content	<ul style="list-style-type: none"> - Provide opportunities to study content through multiple perspectives. - Access subject-specific knowledge in another language. - Prepare for future studies and/or working life.
Learning	<ul style="list-style-type: none"> - Complement individual learning strategies. - Diversify methods and forms of classroom practice. - Increase learner motivation.

Table 1. Common content and learning reasons for introducing CLIL. Marsh and Hartiala (2001, p 16)

¹³ Marsh and Hartiala (2001, p 16) give reasons also from the point of view of context, language (communication) and culture, but here content and learning are the ones considered more relevant.

'CLIL implies a three-way focus on content, language and learning skills' (Mehisto, Marsh & Frigols 2008, p 12). Thus, CLIL practice has to pay attention to certain methodological tips to develop bilingual programme successfully.

Due to the initial language learning interest, CLIL subjects have a methodology strongly influenced by foreign language didactics. This has been even more noticeable due to the fact that English teachers have normally taken the responsibility of these subjects in primary education. Ideally, a CLIL teacher should be trained in both subject and the foreign language, but this is not always the case. Often teachers involved in CLIL are specialised in foreign language and are not familiar with the methodology of the subject or subject teachers who may not possess sufficient language proficiency. The 'ideal competences' a CLIL teacher should have are described in the document "CLIL/EMILE - The European Dimension" Marsh (2002, pp. 79-80).

It is recommendable that teachers have an open mind to teaching, and use quite varied approaches to methodology. As the objective is that the content of non-linguistic areas is conveyed through a foreign language, teachers of non-linguistic areas are supposed to develop a better work, although that is not to say that teachers of linguistic areas are not capable to do so. In any case, teachers have to achieve their own curricular objectives and they have to reinforce and consolidate the assimilation of the academic contents taught in the foreign language.

As the teacher's speech in bilingual classes cannot be followed the same way as teaching in the students' native language, instruction will be more active and student-centred, allowing them to acquire and decode the knowledge at their own pace. Ana Halbach (2008, p 5) talks about the importance of allowing children to participate actively and experiment during the lesson doing hands-on activities, especially in primary education level.

The efficiency of this approach is based on the idea that pupils learn in a natural and unconscious way; this is because the teacher does not focus on the language and students find this language useful in a context. Moreover, they are exposed to more input, as CLIL subjects normally contain a lot of vocabulary. It can be said then that students are more open to languages, but also to the non-linguistic contents. Marsh (2000, p 11) observed that

'There is even the possibility that the learning could be more successful when an additional language is used. This may be due to the child having to work harder at decoding in the additional language, the teacher stressing the main learning points, or other reasons such as high learner motivation resulting from the sense of 'fun' which some children experience.'

Teaching content aspects can be very difficult if trying to do it the same way as in Spanish, so teachers will have to use more visual aids, rather than using so many text format, and so engage students towards the content. Information will be repacked in a manner that facilitates understanding using for example charts, diagrams, drawings, checklists, power point presentations or videos. And when recaling information from the pupils, shorter answers will be expected.

Contrary to what it might seem, as students are paying more attention and are enthusiastic about the idea of learning through a foreign language, they do not see the language as a barrier. The use of a second language could be a problem at first but as Marsh (2000, p 6) declares, 'pupils soon forget about the language and only focus on the learning topic'.

The role of the mother tongue is another key point in the context of CLIL. Some teachers think that it should not be used during the lesson. However, it can be helpful to avoid the lack of contents, misconceptions and to have a deeper comprehension and expression of concepts. Thus, specific terminology should be introduced in both the native and target language since students are expected to apply the contents of the subject in both languages. In addition, it is recommendable to work in cooperation and coordination with the mother tongue language teacher in order to reinforce ideas, working on the same topic from a different point of view.

Therefore, it is interesting to work on projects, in themes or modules; promoting inter-disciplinary and making connections among the different areas. This is also what Halbach (2008, p 8) mentioned about following a holistic learning, especially in the primary education stage. Therefore, learning becomes more relevant because it transcends one classroom and has a wider application.

In spite of everything said, schools often face various limitations to implement CLIL. Teachers find difficulties with what methodology to follow and the organization of the subject as well as with the development of materials. In fact, as Do Coyle observes, 'CLIL is at a dangerous moment: being applied with few guidelines CLIL risks evolving into time-consuming but ineffective and thus frustrating experiences for otherwise eager teachers' (quoted by Ting 2000, p 13). However, there are different lists of tips that CLIL teachers can use as a guide, as for example the one that (Mehisto, Marsh and Frigols (2008, p 29) propose (annex 3).

Over the last few years, however, different publishing houses have developed better textbooks which provide teachers with interactive resources. Nevertheless, there is still a need for a greater variety of suitable CLIL supplies. Furthermore, as Teresa

Ting (2010, p 13) points out, “CLIL material should be more than reading-comprehension exercises in which content has been dramatically simplified”.

Another issue concerning CLIL is the evaluation of students’ performance. Teachers face the problem of correcting both language and content errors. Nevertheless, there are no clear directions about how to do it.

2.4.3. Science in Primary Education.

The current educational law, in the Royal Decree 126/2014 (pp 19365-77), describes how Science, both Natural and Social, should be developed in primary education.

In this area of knowledge students are introduced to the scientific work that has helped to contribute the development of our society and therefore understand its evolution and the current world they live in.

Students will have to develop responsible attitudes and get insight several aspects such as living things, the resources available, the environment, geographical studies, the access to the information, and the behaviour of human beings and their consequences.

But also they will be encouraged towards certain attitudes and values, being curious, show interest and respect for self and others, respect what predecessors have made and try to preserve what they have left.

Moreover, this area contributes to learning how to live with others, learn and work individually but also in cooperation. Pupils have to develop responsible attitudes towards learning, make efforts to get their aims, and create work habits.

Different learning strategies will be fostered to achieve the students’ personal development, starting from what they already know to promote significant learning for them and encourage active participation. The approach to the knowledge will take place from different sources using different materials, books, magazines, newspapers and ICT resources.

Finally, learning Science implies the ‘development of a specific discourse which is the scientific discourse’ (Aragón Méndez, 2007, p 158). Working on this language aspect, students will be more cognitively organised and will understand the world in which they live. Therefore, it is important to provide students with the language resources necessary to convey the meaning and create structures to have a fully development of the rational thought. For Aragón Méndez (2007, p 159), this scientific

discourse is 'necessary to construct scientific concepts and establish appropriate connections between them, working in both specific vocabulary and expressions'.

2.4.4. Science in the 3rd cycle of Primary Education.

At this point, a compilation of ideas will be made in order to understand the main concepts that surround the teaching and learning at the last stage of primary education in relation to the subject of science since the bilingual programme was implemented.

It is important to mention that, as the bilingual programme has been gradually applied in the first level of primary, the first experiences of the programme at the third cycle are recent, and the information in relation to results is also limited.

At this stage, students are already familiar with the programme and have had several learning experiences; they have worked with different materials, methodologies and, quite probably, with different teachers. They are more aware of what learning in a foreign language is and the effort they have to make to succeed, as well as what their strengths and weaknesses are.

In addition, the level of contents at this year is considerably higher as their level of maturity allows them to cope with more amount, and they can understand more abstract ideas. Texts are longer, there is more specific vocabulary, they have to link ideas, work with diagrams and also they have to devote more time to studying.

The level of the vehicular language is more demanding. Sentences are longer with more different structures, they make reference to deeper explanations. Moreover, in a subject like science, students will not only be required to recognise or identify ideas but express processes and make hypothesis.

When children are in a bilingual programme, the support of the parents is crucial. However, when pupils reach a higher level parents find more difficulties to help them when they struggle at some point, mainly because of the language level increase. In lower levels the language might not have been such a barrier and in most cases parents could guess the meaning. But still, when parents cannot understand the meaning, they can try to explain the conceptual idea to the child in the mother tongue.

3. RESEARCH DESIGN.

The following part will describe the methodology of the research carried out in this project. Firstly, it will explain the type of research and the reasons for choosing it. Then the process and how it was developed will be described. The results of the research will be analysed in the following section.

The research consists of a study of single cases. Our intention is not to obtain general conclusions for all bilingual teachers but rather study specific teachers. As the author Robert E. Stake (1995, p 20) says, the main target of case studies is the study of the particularity, not the generalization. The reasons for this type of investigation are often, as well as in this research, the time available for the fieldwork and the access to the places or the people of the study.

The CLIL concept is applied in many different ways, according with the centre thoughts about how it should be better to put in practice. But also every teacher has their own experience. Therefore questionnaires, and more specifically interviews, will help us understand the idea teachers have in relation to bilingualism and the CLIL approach. These cases do not have to be representative of all the schools in the city, they are just a sample to study.

The schools selected belong to the same area of Valladolid; the students' characteristics and their socioeconomic level are similar. But this is not relevant for this research as it is focused on the teachers. The teachers who took part were, on the one hand, primary bilingual teachers and, on the other hand, teachers specifically working in the third cycle. In order to have a more representative data, teachers from different levels were asked to fill the questionnaires in. In addition, questionnaires are more impersonal and teachers can express themselves more freely. Therefore, in the interviews, as teachers had already completed the first part, they were more open and relaxed to give their opinion.

Interviews were initially considered as the best way to discover the thoughts and ways of teaching of the teachers, although there are questions which are more difficult to answer to a "stranger". Therefore the use of questionnaires was considered too as to ask more general questions and anonymously and so, in the interviews it is easier to move to more specific teaching aspects. The time required for the interviews was another important factor too as most teachers are short of time, and are limited to the break time.

As discussed throughout the project, the objective of the research is to discover the way teachers manage in the bilingual classes and to analyse the difficulties encounter when teaching Science in the third cycle of primary education. So in order to draw not only quantitative aspects, teachers could add notes (qualitative data) in the survey if they want to. Thus, the survey is a useful tool in this case to let teachers explain their thoughts in a more anonymous and reflexive way, that leads to a more detailed and focused interview.

Information data was gathered from a total number of 21 surveys and 5 interviews. There are current teachers from 5 schools that include both state and semi-private centres, although not distinction is made between the schools they work in.

For a first contact with the schools, I went to all the centres in person and talked to the head teacher. I explained my project and my aims, asking for collaboration from the teachers. I handed the head teacher a cover letter (annex 4) which explains in more detail the project master alongside several copies of the questionnaire (annex 5) to be filled by the bilingual teachers. Also, I enquired if the teacher(s) working in the third cycle would mind to be interviewed. When I returned to the schools to collect the completed questionnaires, the head teacher told me when the interviews could take place.

The questions of the questionnaire are firstly questions aimed to collect information about the respondents who completed the questionnaires, and the enquiries related to the ideas the teachers have about bilingualism, the formation they have done, the difficulties that appear in the third cycle of primary education in the subject of science in particular and their teaching methodology. During the interviews I asked questions more related to the insight of their teaching practise (the dealing with scientific aspects, the adaptations for a bilingual class, their teaching role, how to make classes understandable to the students, groupings, projects, evaluation, homework, materials). Also, some teachers showed me some of the resources they use or visit them during a lesson.

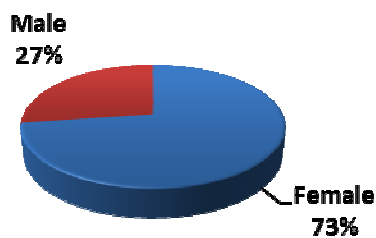
As the main objective of this type of investigation of case studies is the total understanding of the single cases, during the development of the interview, the questions previously proposed had to be adapted to the interviewee's utterances. This is what Matcolm Parlett and David Hamilton (1976) called the *progressive focusing approach*. The questions were mostly covered; the order of the questions is what depended more on the answers teachers gave.

4. INTERPRETATION OF DATA.

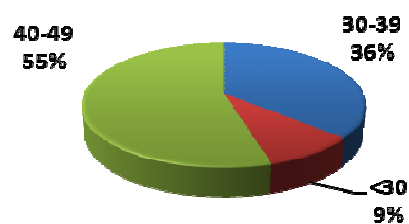
This part has been divided in two sections, firstly the results of the surveys, which have been answered from all the teachers, and then the interpretation of the teachers interviewed.

4.1. QUESTIONNAIRE RESULTS.

The first three questions are related to the **gender**, the **age range** and the **mother tongue** of the teachers. It is observed in that a majority of them are women, being 73% against 27% men. In relation to their age we find that most of them, the 55%, are in the range between 40 and 49, that 36% of them are between 30 and 39, and that only 9% of them are under 30. The third data collected, the mother tongue, shows that, as it was predicted, the total number of the teachers are non-native speakers of the target language.



Graph 1. Gender of the teachers.



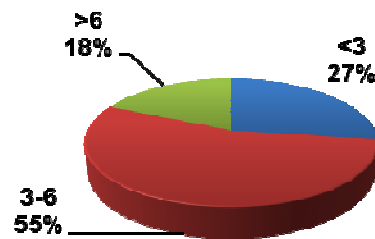
Graph 2. Age of the teachers.



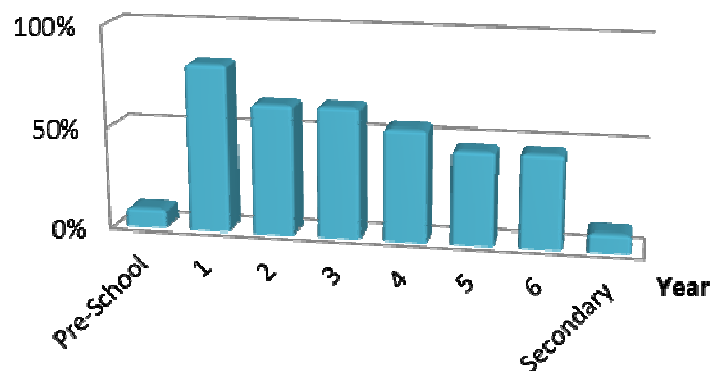
Graph 3. Mother tongue of the teachers.

The next information is related to the **experience** teachers have teaching in bilingualism. They have been asked about the **number of years teaching CLIL** and the **school years** they have taught in. These are significant details for the research as the more years teachers have been involved in the programme, the better opinions and comparison can make as they have more knowledge of the reality and problems in the class. As we can see in graph 4, more than half of the teachers interviewed have been working between 3 and 6 years, so this shows that the opinions of the teachers are

based on many years of experience. In addition, the results in graph 5 show a variety of courses in which teachers have taught in, being less in the third cycle than in previous levels as it was expected since bilingual programmes have been implemented gradually from the lower level, and even in some schools they are not teaching CLIL in the last year yet. Therefore, it is observed that most teachers have a significant background in teaching bilingual classes.

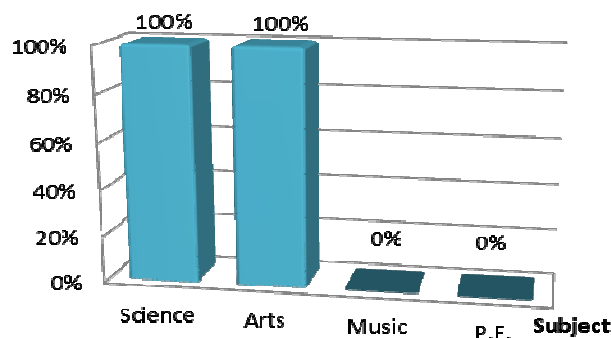


Graph 4. Number of years teachers have been teaching CLIL.



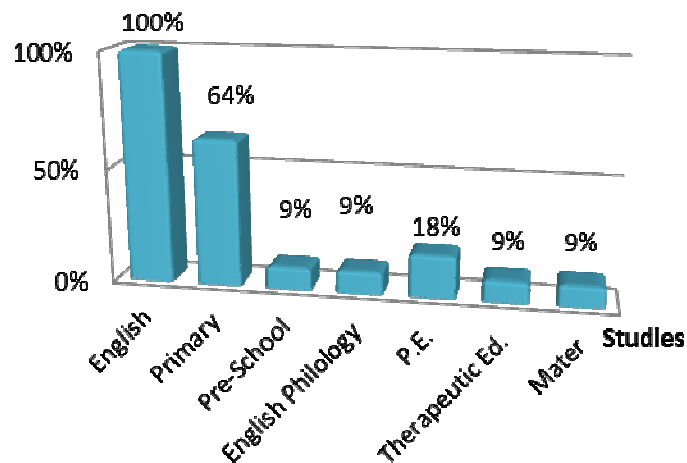
Graph 5. School years in which teachers have taught.

Graph 6 points out the **subjects** in which teachers have taught CLIL. As we can see all teachers have taught in Science and Arts, whereas any of them have taught in other areas such as Physical Education or Music. This was predictable as explained before, bilingual schools in Castilla y León schools are required to teach a minimum of two non-linguistic areas, and Science and Arts seems the most appropriate subjects to choose.



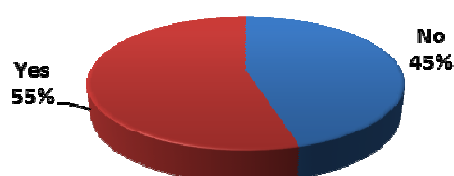
Graph 6. Subjects in which the teachers have taught CLIL.

The following question is related to their **formal studies** so far. The results in graph 7 shows that all of them have the primary speciality of English, and some have studied also primary, other specialities of primary education like Physical Education and Therapeutic Education. There is one teacher who has studied a high degree in Education¹⁴ and another teachers explained that she has studied an English Philology and a Master, which is is realted to CLIL as it is mentioned in the next section.



Graph 7. Studies the teachers have taken.

The current legislation does not bind bilingual teachers to have specific **training in CLIL**, although it is recomendable and useful. The only requirement is to have a B2 CEFR level in the vehicular language. As seen in the graph 8, 55% of the teachers have some kind of training. The teachers who has some training comment they have taken bilingual courses with th British Council, attend specific courses the Official School of Languages¹⁵ organises, take part in workshops and CFIE¹⁶ training courses. There is one teacher whose master project was entitled *Tradisposición didáctica en metodología CLIL y su configuración en el libro de texto*.



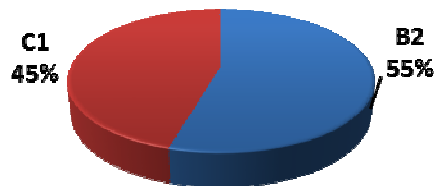
Graph 8. Training in CLIL methodology.

¹⁴ Ciencias de la Educación.

¹⁵ Escuela Oficial de Idiomas.

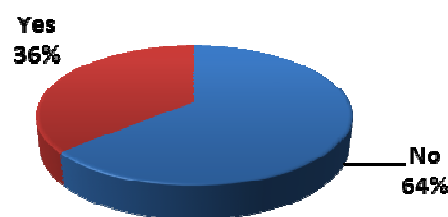
¹⁶ Centro de Formación del Profesorado e Innovación Educativa.

The next topic deals with the **CEFR English level** teachers consider that a primary education **teacher should be required for teaching in the third cycle**. This is relevant for the research as one of the problems teachers have encountered is the difficulty to give better explanations and be fluency in the speech. Therefore, surprisingly, more than half of the teachers' surveys show that a B2 is enough. Even though, one teacher in the interview firmly expressed that teachers should not be required more than a B2.



Graph 9. CEFR English level teachers consider that should be required for teaching in the third cycle of Primary Education.

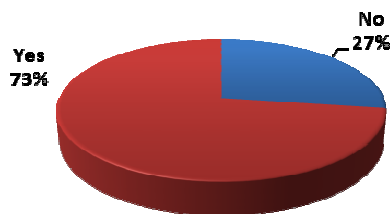
Graph 10 shows whether teachers have **experience teaching or not in the third cycle** of primary education, and also were asked that, in the case the answer was affirmative, explain if they find it is more difficult. Some complaints of those teachers who have taught in this stage are focus in the higher level of the contents and its reduction to almost vocabulary, which is very specific. A teacher comments, however, that it is not more difficult in general.



Graph 10. Teaching experience in the 5th or 6th years of primary education.

During the research, some references have been made to the **differences between the teaching of science in the mother tongue and in in the foreign language**. Therefore this question aims to know if the teachers find these differences. Firstly they have been asked if they have taught the subject in Spanish, and the results in graph 11 shows that most of them did. In relation to the differences teachers note are the students inability to convey ideas, the need for more vial support in order to understand the contents, the simplification of ideas. Other teachers consider that using students' mother tongue it is easier to explain or give definitions and the progress is

faster, they consider the difficulties students face when the language is a barrier for them which difficult their learning in the non-linguistic subject, or even, it is mentioned that in Spanish there are more learning techniques.



Graph 11. Teachers experience in teaching Science in Spanish¹⁷.

Questions number 12 and 13 of the questionnaire are related to the specific **problems** or challenges **teachers encounter** when teaching through a foreign language in the third cycle and **what they should modify** considering three aspects: the teaching practise, the students and the subejct and material. Although this issue will be subsequent questioned, these questions were initially designed to bring up the teachers opinions, the first ideas that come to their mind.

Teachers' answers to question 12 are: the abstraction of some concepts in the Social Science area, comprehension and reading, the vocabulary, the ability to express fluently in the language during all the lesson, the differences in the students' level, the families, the lack of specialization in Science, lesons planning and the resources availability.

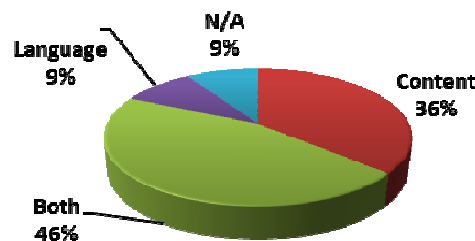
Improvements teachers suggest in question 13 are the following:

- Teaching: planning, fluency, language level, less theory and more practise, adapting to the students' English level.
- Students: doing more listening and reading activities, motivation, avoid translation.
- Subject and materials: more interactive whiteboards and visual materials, more technological support.

Moving on to the next question, it is discussed the equality or not **importance of content and language** in the CLIL lessons. In the graph 12, results show that half of the teachers think that language and content are equally important, whereas 36% consider content the most relevant aspect, and only 9% find the target language the key point. Nevertheless, although in a CLIL class the target language is used as a

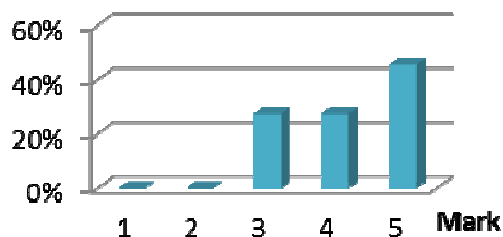
¹⁷ Conocimiento del Medio, Natural, Social y Cultural. This subject has been split into Natural and Social Science with the current legislation.

means of communication, the current law in Castilla y León for bilingual programmes, as explained above, articulates that teachers will focus on the area of knowledge and evaluation must be in accordance with the current legislation i.e., the evaluation standards of the area of science.

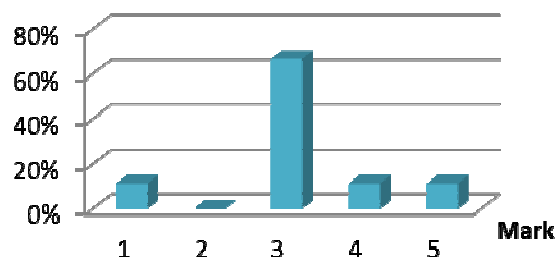


Graph 12. The election teachers take between language and content in CLIL lessons.

In the graph 13, teachers' answers show an agreement on the **improvement of the foreign language** when studying with CLIL, pointing out the vocabulary they gain, the expressions and the comprehension. However, they consider, as observed in the graph 14, that, in relation to the non-linguistic areas, the **foreign language** can be a **barrier** for some students.

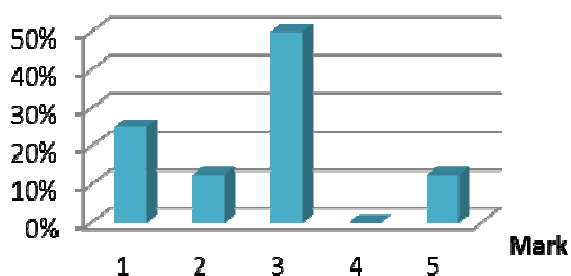


Graph 13. Improvement of English level.

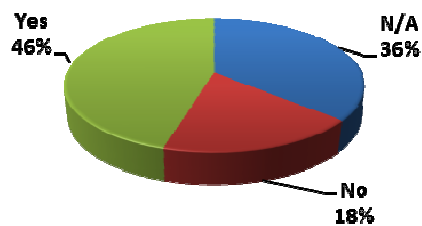


Graph 14. English as a barrier for Science.

Next three questions, 17, 18 and 19, were designed to know whether the use of **CLIL benefit the subject of Science**. First of all, teachers had to mark from 1 to 5 how beneficial the programme has been for the Science level and, as we can see in the graph 15, they do not think it has really benefited. In the graph 16 teachers grade whether the Science levels have fallen, being 'yes' in nearly half of the answers. Teachers note that this fall in the level can be strengthened by providing Spanish input, and therefore not to lose important vocabulary in their mother tongue. In addition, this fall especially affects children with learning difficulties. One of the teachers who considered that there is not such fall said that it is easier to teach. Even though, she adds that students like this type of learning as they are uncounscious of the language learning and focus on the vocabulary.

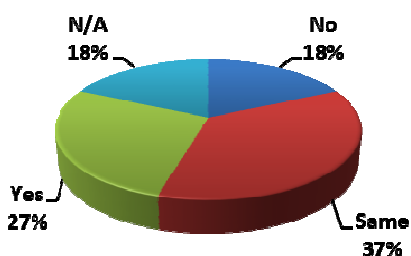


Graph 15. Grade of benefit in Science level.

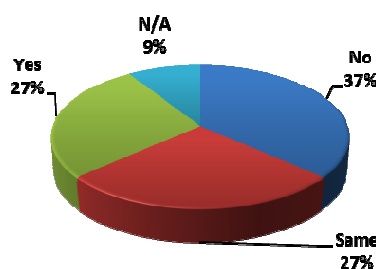


Graph 16. Fall of Science level.

Questions 20 and 21 aimed to know whether the teachers observed that students' **motivation** and **independence** in learning have **improved** due to being involved in a bilingual context. Graphs 17 and 18 show variety in the answers. Teachers do not seem to get an agreement, there is not a clearly direct relation between bilingualism and the motivation and the independence in learning.

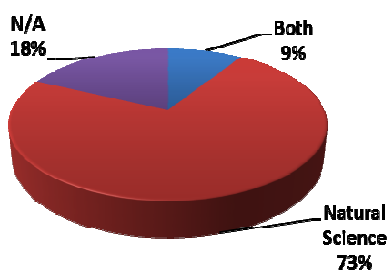


Graph 17. Improvement on motivation.



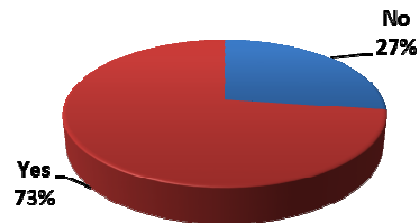
Graph 18. Improvement on independence.

What should be taught through English, **Natural Science**, **Social Science** or **both**? This is a question that have arisen interest as many people complained about the need to learn Social knowledge in a foreign language. As the graph 19 show, the vast majority of teachers claim that only Natural Science should be taught in English, and leave social units in Spanish. This option is now easier to carry out due the new law LOMCE which considers them as two different subjects.



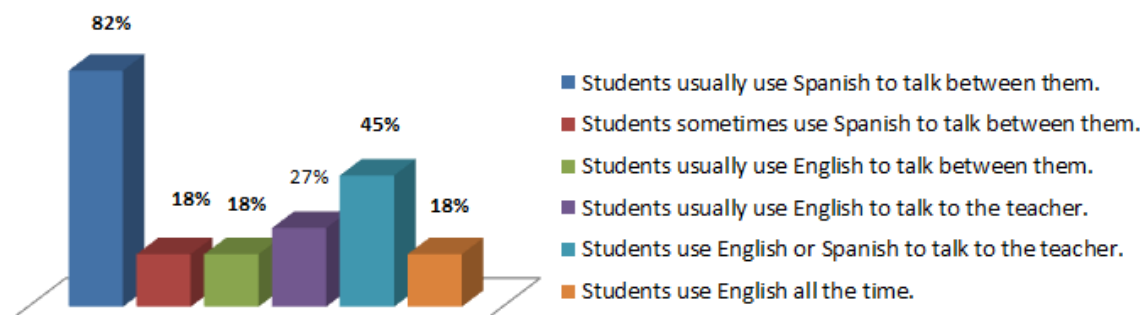
Graph 19. Science areas that teachers think should be taught through CLIL.

Should the **students' native language** be used during the **CLIL lessons**? There are different opinions about this. The 73% of the teachers involved in this research accept that they use it. Some of the reasons they give are, for instance, for explanations after having tried in English before, and ensure they learn main ideas and also to help those students with special needs. Other arguments are to tell off students for their behaviour or lack of attention.



Graph 20. Use of Spanish during the CLIL lessons.

The following data collected deals with the **communication with and among students** during the CLIL lesson. Science lessons are based on experience, feelings and understanding, therefore during the class students need to express themselves. The aim of this question is to know how the teacher and students interact in class. The results in graph 21 show that the majority (82%) of teachers claim that their students tend to use their native language, especially when they are talking between them.



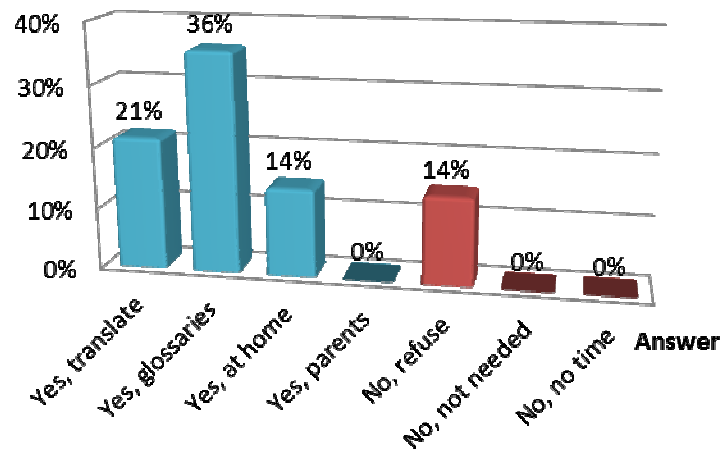
Graph 21. Description of the communication in the classroom.

The next question was designed to get to know if they deal with the **vocabulary in Spanish** as well or only in English. The issue of losing the first language lexicon is a concern in CLIL. Coyle, Hood and Marsh (2010, p 16) observed that some teachers think bilingual learning can result in learners not understanding key terms in their first language. They suggest using translanguaging¹⁸ to overcome this concern by using first-language materials such as vocabulary and concepts checklists to support teaching in the CLIL vehicular language. And, aforementioned, the current legislation in

¹⁸ Translanguaging refers to a systematic shift from one language to another for specific reasons.

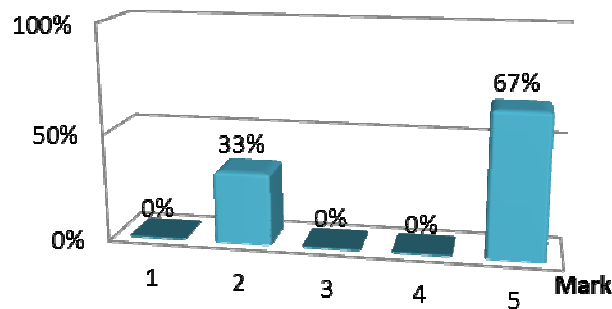
Castilla y León claim that teachers will try to foster students to acquire the specific terminologies in both languages.

The position of the teachers in relation to whether the use or not of Spanish is observed in graph 22. And overwhelming percentage of teachers admitted to deal with both lexicons. In one of the schools they have Science both in English and in Spanish, so, although they are not translating in class, they deal with the same area of knowledge at the same time in both classes.



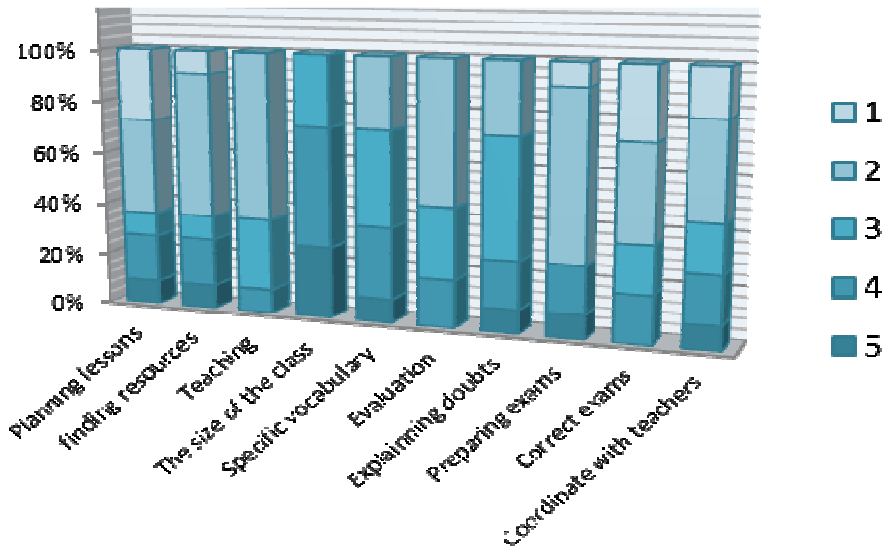
Graph 22. The knowledge of the key concepts in both languages.

Questions 26 and 27 had the purpose to see the importance or not to be the **same teacher in charge of both English and Science**, and how do they coordinate in the case they are not teaching both subject. It is true that teachers are not the ones who can decide in most cases but the head master, still they observe the students' progress. The answers were very opposite, being a 33% of teachers for a 2 and 67% for a 5. Those who coordinate with the English teacher do it in weekly basis. They deal with the same grammar points. One teacher even considers the idea of collaborating with teachers specialised in science.



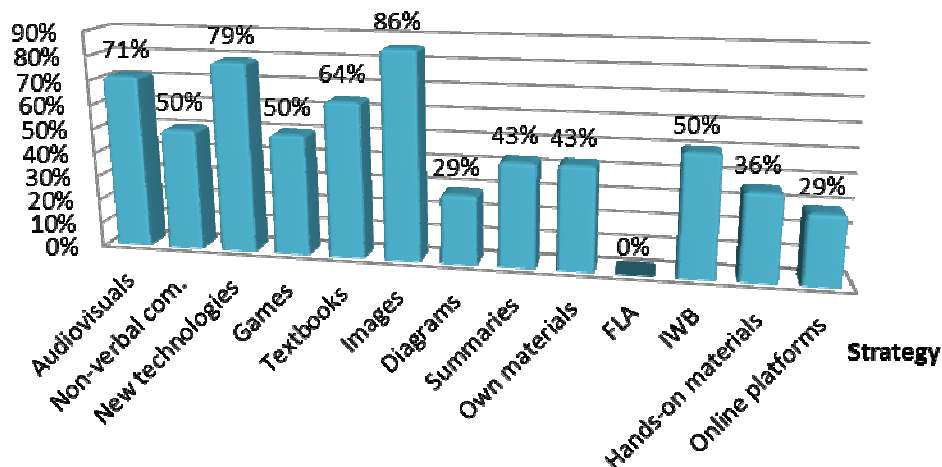
Graph 23. Importance of having the same teacher for both Science and English.

There are several **problems CLIL teachers have encountered in the teaching process** At this point they had to grade from 1 to 5 how difficult the following aspects are for them. At the graph 24, it is seen how the size of the class is the one who receives more difficult answers followed by the use of specific vocabulary, explaining doubts whereas correcting exams is the least difficult.



Graph 24. Difficulty of different teaching aspects.

In order to know the different **strategies** teachers use in their classes, this question presents a variety of them and teachers had to tick those they use. As observed in the graph 25, the ones that teachers use the most are new technologies, images and audiovisuals. Surprisingly is the fact that any of them have Foreign Language Assistants (FLA). However, I found later that the FLA is used during the English lessons, not in bilingualism ones, that is why they did not mark it in the questionnaire.

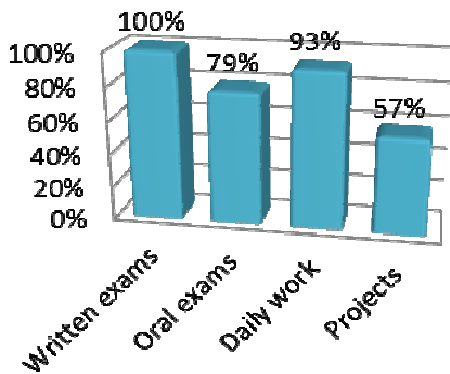


Graph 25. Strategies bilingual teachers use in the class.

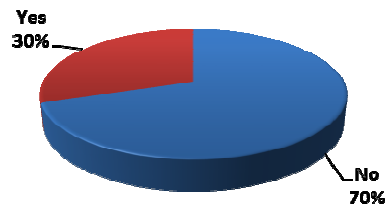
Different opinions there are about **evaluation** in bilingual classes, questions from 30 to 33 deal with this issue. Teachers had to tick the ones they use between written and oral exams, daily work and projects. And the results in graph 26 show that all of them do written exams and evaluate daily work, a high percentage (79%) do oral exams and only a 57% carry out projects. These teachers who carry out projects explain in question 31 that they do oral activities in groups, pair or group projects and others say they do projects in Arts related to the science topic they are dealing with.

Question 31 enquires about the **evaluation of content and language** in Science. Most answers focus on the idea that they give more importance to the content. And actually, this is what they have to do as, aforementioned, the current law legislation about bilingual programmes claims that curricular subjects taught in a foreign language will not modify the basic curricular aspects. And evaluation is one of those curricular aspects.

Last question with regard to evaluation is the **penalisation of language errors**. As seen in graph 27, most teachers (70%) do not punish students for their errors. Some teachers have added that they do not do it as far as the idea is understandable.



Graph 26. Students' evaluation.



Graph 27. Penalisation of language errors.

Finally, respondents were asked to say which information or training they would find more useful in order to **achieve better practices** in bilingual classes. Their answers are varied, they refer to reading about current CLIL researches, assist workshops, observe other teachers while teaching, reduce the number of students, carry out projects or attend courses in English-speaking countries.

4.2. INTERVIEWS INTERPRETATION.

The second part of the interpretation of data is related to the interviews carried out in the schools to teachers taking part in bilingual classes. It was preferable to choose those teachers who have been working in different stages and so with more experience and, when possible, the bilingualism coordinator.

This part is organised around the particular teachers, describing one by one the cases, their thoughts about the problems they observe in bilingualism programmes, especially in the third cycle, and the explanation of their teaching practise. We will try to refer to the different aspects that help to describe a methodology, i. e. the goals of the teacher, the role of teacher and learner, the teaching and learning process, the nature of student-teacher and student-student interaction, the learning theories, the use of the students' native language, evaluation and the response to students' errors. However, such an intensive description is not usually possible to get because of the limit of time and the fact that these aspects are not so easy to interpret in an interview.

4.2.1. Teacher A.

The first teacher who was interviewed has been enrolled in bilingual teaching only for the last three years, although she has a long experience teaching English as a foreign language. She has tried to have a good English level and training in bilingualism, and even studied a master related to it. She admits not to have taught the area of science in Spanish before.

For her, content is the most important aspect, although it is inevitable for her to make references to the English language. She is not in charge of the subject of English and provides language support in order to help students to describe and talk about topics. She has developed several language cards as a model for students to help them when speaking (describing, defining, introduce a topic...).

During the lessons she tries to maintain communication all the time in the target language, although sometimes she says things in the students' mother tongue, especially with translation of words, and to be able to carry on with the activity. She starts the lessons by asking students about the content taught in previous lessons trying that all of them get involve and participate.

The class is organised in groups of four or five students in order to promote communication between the learners and reduce the level of anxiety. Students seem

motivated and willing to learn; they pay attention to explanations and have a good level of comprehension, although she is worried about their utterances on the issues of the subject.

The teacher uses the textbook as a reference although she brings also other materials to complement learning and motivation, such as puppets and extra sheets. In order to work independently and gain vocabulary and confidence, students have to do projects and research in pairs or in groups. For example, they have to look for information, in Spanish, about a topic or character and then they write a short text with the most important ideas.

4.2.2. Teacher B.

The second case is a teacher with longer experience in bilingualism than the previous one, although has only worked within the first cycle and is not only dedicated to it as he is a tutor and so teaches in other areas of learning too. He has taught science in Spanish before and, trying to teach the same contents, finds himself limited to time and explanations. For him, teachers should have a higher level of English.

One of the main problems he encounters is the summary in the target language; the students' level of English is not enough to reach the fluency in writing. Therefore, he works a lot with diagrams and key ideas.

The school in which this teacher works in, divides classes once a week during bilingual lessons. While some students are in Science, the other half of the class has Arts. The size of the class is, therefore, reduced and the quality of the teaching is better. Students are mostly working all together rather than in groups.

In addition, Science is given in both Spanish and English providing the students with two approaches to the subject, as they do not use the same book which is translated into the other language, books are from different editorials. Teachers are coordinated to teach the same topics at a time. However, although they have been teaching natural and social science both in English, this year they have changed and only teach natural units in English.

This teacher does not agree with the bilingual programme. He is an English teacher and, although he agree that teaching science in English has improved the students' level of English, he thinks that English should be only taught in the English subject. And he adds that it would be better for students to learn sciences in their mother tongue.

4.2.3. Teacher C.

The following case study is a teacher who has been working in bilingualism for many years too; she started teaching it since the school introduced the programme and has taught at all the level of primary education. Being now in the sixth grade, she has a broaden opinion.

The school is the same as the previous one, so the way in which bilingualism is organised has already been explained; therefore I will focus on the teacher's methodology. She is a specialist in English and she tried to stick to the English language as much as possible. Explanation of ideas is not that difficult for her and neither for students to follow, as most contents have been explained in Spanish before. Both Spanish and English teacher plan at the beginning of year and introduce Spanish contents first. Even though she adds that most students try to speak in English to the teacher although sometimes they change to Spanish when they do not know how to say it; and they often use Spanish to talk between them.

In relation to her teaching practise, she makes use of many resources from the net, with videos, games, images. During the lessons, she tries students to make use of the target language and organise them into groups and sometimes in pairs. They develop many activities in groups and create wall diagrams, they get involve in their learning process and enjoy during the class. She is fond of using games during the lesson as it helps to lower the anxiety of talking in English and they are motivated.

Different methodology is developed in the Spanish science lessons. They work more on the explanation of contents and have longer written material. As students cannot fully explain in English, they use the time in Spanish to develop a linguist competence in scientific aspects, asking for hypothesis and opinion about science processes. And so, in English they focus more on vocabulary and key concepts. Books are shorter in English and students feel confidence working this way.

In relation to the evaluation, I found surprising the fact that, as there were worst marks in Science through English, they decided to give more weight to the Spanish marks in the final evaluation.

Besides, this teacher does not believe at all in the programme, and thinks that, in order to learn English, students should have more English classes instead of teaching it through non-linguistic areas.

4.2.4. Teacher D.

The teacher who was interviewed in this case has been teaching bilingualism for four years already, she has been in the first three years of primary education. Before, she has been working as an English teacher and as a tutor too, therefore she had to teach Science in Spanish for many years. This teacher has the experience of the bilingual education that students have received before reaching the third cycle and why she thinks the students find problems afterwards.

In order to teach science through a CLIL methodology, she had to adapt the concepts, focus on the main ideas and provide students with lots of diagrams and “pictionary books”. All these material supports are in the target language, she does not use the Spanish during the lesson, but at the beginning of the unit in order to introduce the main topic lesson. However, when asked about how she deals with the Spanish concepts, she considers they should be taught but not translating. She is in favour of having science in Spanish at some point during the students’ primary education, and suggest teaching one year in the target language and the following in the native one, and so students would receive the input in both languages.

She considers the students’ level of English to be one of the main problems to success in science. When they start in the first level of primary education they are assumed to have a linguistic competence that they do not really have, especially in reading and writing. And therefore, if students do not have the basic linguistic level, they struggle with the content aspects. Another point she has observed is the parental support; in the cases the parents can help with the language, they show better development whereas those students with no so much assistance seem they only study science in class. She adds even that what some parents do is translate contents.

As students have their book and they have to through all the contents, the teacher considers students cannot be involved in projects or in many group and pair work; most of the work they do is individually, as they have to finish the content of the unit. She suggests having more hours of science, or even better to have the same teacher for all the subjects taught in the foreign language, so then ideas would be exposed in a more complete and coherent context.

Above all, she does not find much support from the educative community to develop bilingualism with more quality as she does not have free hours to prepare extra materials and the fact that there are not many training courses about bilingualism. For this reason she does not believe that much in the programme. Moreover, she notices that more often teachers reject teaching in bilingualism after sometime and, the

teachers who end up teaching are those with less experience and who stay in the schools for short periods of time, resulting in poor development of the bilingual programmes.

4.2.5. Teacher E.

In this case the teacher is the bilingual coordinator of the school in which she has been teaching in since the implementation of the bilingual programme there five years ago. She explained how the programme had evolved and how teachers coordinate.

In her school, teachers work hard and are very motivated. They prepare many materials and use variety online resources, apart from the textbook. The school is well-known for its development and results. First years teachers were temporary, but now most are permanent and this helps to create a hard working teaching environment. Still, it is not possible to ensure all the classes with the same teacher for the bilingual subjects and the English one; there are teachers who do not hold the bilingual certification. However, teachers are well coordinated and have meetings at least once every term to define the main guidelines.

Although, she teaches only the first cycle of primary education, she knows how higher levels work. When asked about the main difficulties she finds in the third cycle, she explains that teaching in another language might be more difficult for the teacher if you do not have enough competence in English, and still, they can succeed if they make good use of online resources. In relation to the students, she thinks that if you prepare students from the beginning and have a good base, they will not find so many problems in higher levels.

In her class, she encourages students to take part in their learning process, she asks students everyday about contents of the unit, then they do group activities and finally they do individual work. In addition, they are involved in group projects in every unit.

She is aware of the importance of being familiar with the concepts in both English and Spanish, therefore at least a lesson is taught in Spanish in every unit; the teacher provides students with material with diagrams and explanations in Spanish. Parents can see what they are learning and may help though. And, for those students who struggle with the language and are not able to follow the lessons, they were given the option to use a translated version of the textbook and they will be evaluated in Spanish too. However, parents play an important role in these cases; they have to commit themselves to work with the child at home.

When enquired about the level of science, she admits that they cannot get the reach the same development as when taught in Spanish, but they are exposed to other material and input which enrich them too.

Evaluation is varied, as the way learners have to interact with the world. An exam that measures only concepts is not enough, different competences are considered.

5. CONCLUSIONS.

The project has focused, on the one hand on the understanding of the current practices and methodologies of the teachers working in bilingual schools and the adaptations they have had to do. On the other hand this paper has been aimed at the balance teachers do between the teaching and learning process in the third cycle of primary education. In order to accomplish this, an overview of different methodologies both in the language and in the content context was carried out to support the research in a theoretical framework. Then, a small scale investigation was conducted in the form of surveys and interviews to several primary CLIL teachers.

The bilingual programme has been implemented in the schools of Castilla y León since 2006, therefore teachers already have some experience in the field and have been able to address their teaching practice so far. Questionnaires have been useful for the investigation as have provided a general view of the teachers practice, however, the information obtained from the interviews enable much more detailed facts and enriching the conclusions drawn.

In relation to the teachers' **methodologies** and their **teaching practice** several ideas are pointed out:

- Most teachers have English language as first educational training and give a great importance to communication during the lessons.
- Teachers consider important the students' prior knowledge of the subject and at the beginning most admit to elicit their interest.
- Teachers are aware of the importance of providing extra support, and prepare sheets, images and videos, making use of the IWB when possible. Students nowadays are used to learn in different ways, not only memorizing, and therefore the use of technologies is crucial.
- Sometimes students have to learn things by heart, this would be more conductism. However, most teachers follow a constructivism approach since they give importance to the students progress and their participation.
- In general, teachers think that group work and projects are a good practice to engage students and make a real use of the language. (this was not always the case in lower levels)

- There are different opinions about the use of the Spanish in class. Teachers try to teach everything in English, although, in general, they use Spanish for difficult explanations or even at the beginning of the unit.
- Due to the concern about the need to provide Spanish input, two of the schools visited provide students with material in their mother tongue.
- Teachers would prefer less students in the class, as it is difficult to have a control of all the students using a second language .
- Teachers had a great motivation at the beginning, but there are some who admit they do not agree with the implementation of the programme. They complain about the great amount of work they have to do, and some even say that, in order to learn English, this is not the best idea and that it would be better to take more classes in the target language.

Related to the **third cycle** of primary education, some ideas have arisen from the practise. Although most teachers did not have much experience at this level yet, because of the recent implementation of the programme, they could prompt their thought about this.

- Level of English of the contents and explanations. Especially difficult if the teacher is not the same as the English one. Even though, it should be taken into account that the language can be a barrier because 'the language needed in CLIL settings does not necessarily follow the same grammatical progression in language-learning setting' (Coyle, Hood & Marsh 2010, p 35).
- Teachers find difficulties to develop expressive skills, specially writing. Students understand what is been taught but when have to speak or make summaries, they struggle with that. So most admit to do more schemes than witing.
- The teachers agree that English should be taught by the bilingual teachers, and though be able to provide a more coherent and complete learning experience.
- The teachers find teaching in another subject like Art useful because they can make interferences in the learning, doing activities related to science aspects.
- Lack of experience and training in scientific aspects, and this is more explicit when teaching in high levels. Most teachers have a language training, and even though many of them have experience teaching it in Spanish, they still affirm to have troubles to cover the scientific aspects in a foreign language.

- Some teachers consider interesting observing other teacher to know how they perform during the lesson.
- Coordination to implement a good bilingual programme in the school. This is then a consequence in the high levels, if every teacher was working in a different way. Some teachers talked about the instability in the bilingual teaching staff, who tend to change the school every one or two years.
- In order to work in bilingualism, the FL should not be the only requirement, but also knowledge in the subject.
- Teachers require more teaching training in CLIL.

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7. ANNEXES.

Annex 1: LANGUAGE TEACHING METHODS.

<u>Method</u>	<u>Language Learning</u>	<u>Language Teaching</u>	<u>Principles</u>	<u>Techniques</u>
Grammar-Translation	Exercise mental muscle.	Have students translate from target language (TL) texts to native language.	<ul style="list-style-type: none"> - Goal: Read literature in the L2. - Learn grammar rules and vocabulary. - The teacher is the authority. - Deductive grammar learning. - Reading and writing are the primary skills to be developed. - Evaluation: translate written texts. - Accuracy is emphasised. 	<ul style="list-style-type: none"> - Translating literary passages. - Reading comprehension questions. - Antonyms/synonyms. - Cognates. - Fill-in-the-blanks. - Memorization. - Use words in sentences. - Composition.
Direct method	Associate meaning with the TL directly.	Use spoken language in situations with no native-language translation.	<ul style="list-style-type: none"> - Goal: Communication. - Pronunciation importance. - Inductive grammar learning. - Speaking over writing. - Vocabulary over grammar. - No translation allowed. - Meaning conveyed through demonstration and visual aids. - Self-correction of errors. 	<ul style="list-style-type: none"> - Reading aloud. - Make questions and answers. - Conversation practice. - Fill-in-the-blank exercises. - Dictation. - Map drawing (directions) - Self-corrections. - Paragraph writing.

Audio-Lingual method	Overcome native language habits; form new TL habits.	Conduct oral/aural drills and pattern practice	<ul style="list-style-type: none"> - Goal: Natural use of language. - Language in context. - Acquisition of structural patterns. - Inductive grammar learning. - Teacher as a model of the FL. - Not use of native language. - Prevent errors. Immediate correction. 	<ul style="list-style-type: none"> - Dialogue memorization. - Background build-up drill. - Chain drill. - Transformation drill. - Minimal pairs. - Complete the dialogue. - Grammar game.
Silent way	Develop inner criteria for correctness by becoming aware of how the TL works.	<p>Remain silent in order to subordinate teaching to learning.</p> <p>Focus student attention.</p> <p>Provide meaningful practice.</p>	<ul style="list-style-type: none"> - Goal: Independent learning. - Start from students' knowledge. - Silence fosters autonomy and the teacher is not focus of attention. - Teacher speaks when necessary. - Encourage group cooperation. - Meaningful practice, no repetition. - Evaluation: progress observation, not formal tests. - Errors are natural. Self-correction. 	<ul style="list-style-type: none"> - Sound-colour chart. - Teacher's silence. - Peer correction. - Rods. - Self-correction gestures. - Word charts. - Fidel charts. - Structured feedback.
Desuggestopedia (Suggestopedia)	<p>Overcome psychological barriers to learning.</p> <p>Deliver advanced conversational proficiency quickly.</p>	Desuggest limitations: teach lengthy dialogues through musical accompaniment, playful practice, and the arts.	<ul style="list-style-type: none"> - Goal: Everyday communication. - Conscious, subconscious learning. - Fine arts are used. - Atmosphere of play. - Translation to convey meaning. 	<ul style="list-style-type: none"> - Bright and cheerful classroom set-up. - Peripheral learning (posters). - Positive suggestion. - Choose a new identity.

			<ul style="list-style-type: none"> - Writing before speaking. - No homework assigned. - Evaluation in class, not formal tests - Errors corrected gently. 	<ul style="list-style-type: none"> - Role play. - First reading by teacher. - Primary activation. - Creative adaptation.
Community Language Learning	Learn nondefensively as whole persons, following developmental stages	Include the elements of security, attention, aggression, reflection, retention, discrimination.	<ul style="list-style-type: none"> - Goal: Communication. - Understanding and speaking are the most important skills. - Teacher's role: counsellor. - Fluency over accuracy. - Mainly for adult learning. - Native language gives security. - Self-evaluation. - Correct in a non-threatening way. 	<ul style="list-style-type: none"> - Tape recording students. - Transcription. - Reflection over experience. - Teacher as 'Human Computer'. - Small groups tasks.
Total Physical Response	Listen and imitate. Associate meaning with TL directly.	Delay speaking until students are ready. Make meaning clear through actions and visuals. Direct behaviour.	<ul style="list-style-type: none"> - Goal: reduce stress and enjoy. - Meaning clear through actions. - Understanding before speaking. - Vocabulary and grammar first. - Native language at the beginning. - Evaluation: observe student' actions. - Errors corrected unobtrusively. 	<ul style="list-style-type: none"> - Use commands to direct behaviour. - Role reversal. - Action sequence.

Communicative Language Teaching.	Interact with others in the TL Negotiate meaning. Responsibility of own learning.	Promote communication.	<ul style="list-style-type: none"> - Goal: communicative competence and develop the 4 language skills. - Authentic knowledge, real context. - Fluency over accuracy. - TL as a vehicle for communication. - Judicious use of native language. - Communicative activity: information gaps, choice and feedback. - Teacher's role: facilitator, advisor. - Errors are natural. Teacher notes them and explain them later on. 	<ul style="list-style-type: none"> - Authentic materials. - Scrambled sentences. - Language games. - Picture strip story. - Free production. - Information gaps. - Role plays. - Problem-solving tasks.
Content-based or CLIL approach.	Attend to what is being communicated, not the language itself except when form-focused.	Engage students in learning other subject matter.	<ul style="list-style-type: none"> - Goal: use the language within academic context and learn content. - Content-driven. Language used to convey content. - Vocabulary is the subject content. - Inductive grammar learning. - Need language support. - Authentic materials and tasks. - Collaborative learning. (t-s, s-s) - Errors are part of learning. Teacher will be tolerant and focus on content. 	<ul style="list-style-type: none"> - Write term papers. - Note-taking. - Understand meaning of the whole texts. - Problem-solving negotiation. - Information-gap activities. - Projects. - Hands-on experiments. - Checklists. - Charts, diagrams, drawings.

Table 1. Summary of the Language Teaching Methods. (Own elaboration based on the data analysed).

Annex 2: BLOOM'S TAXONOMY, revised by Anderson and Brathwohl.

The Cognitive Process Dimension	
<i>Lower-order processing:</i>	
Remembering	Such as producing appropriate information from memory, e.g. <ul style="list-style-type: none"> • Recognizing • Recalling
Understanding	Meaning-making from experiences and resources, e.g. <ul style="list-style-type: none"> • Interpreting • Exemplifying • Classifying • Summarizing • Inferring • Comparing • Explaining
Applying	Such as using a procedure, e.g. <ul style="list-style-type: none"> • Executing • Implementing
<i>Higher-order processing:</i>	
Analysing	Breaking down a concept into its parts and explaining how the parts relate to the whole, e.g. <ul style="list-style-type: none"> • Differentiating • Organizing • Attributing
Evaluating	Making critical judgements, e.g. <ul style="list-style-type: none"> • Checking • Critiquing
Creating	Putting together pieces to construct something new or recognizing components of a new structure, e.g. <ul style="list-style-type: none"> • Generating • Planning • Producing
The Knowledge Dimension	
Factual knowledge	Basic information, e.g. <ul style="list-style-type: none"> • Terminology • Specific details and elements
Conceptual knowledge	Relationships amongst pieces of a larger structure that make them part of the whole, e.g. <ul style="list-style-type: none"> • Knowledge of classifications and categories • Knowledge of principles and generalizations • Knowledge of theories, models and structures
Procedural knowledge	How to do something, e.g. <ul style="list-style-type: none"> • Knowledge of subject-specific skills and algorithms • Knowledge of subject techniques and methods • Knowledge of criteria for determining when to use appropriate procedures
Metacognitive knowledge	Knowledge of thinking in general and individual thinking in particular, e.g. <ul style="list-style-type: none"> • Strategic knowledge • Knowledge about cognitive tasks • Self-knowledge

Table 2. Bloom's taxonomy, revised by Anderson and Brathwohl. (Adapted from Anderson and Brathwohl (2001, p 67-8 - cited in Coyle, Hood & Marsh 2010, p 31).

Annex 3: CORE FEATURES OF CLIL METHODOLOGY

Multiple focus

- supporting language learning in content classes
- supporting content learning in language classes
- integrating several subjects
- organizing learning through cross-curricular themes and projects
- supporting reflection on the learning process

Safe and enriching learning environment

- using routine activities and discourse
- displaying language and content throughout the classroom
- building student confidence to experiment with language and content
- using classroom learning centres
- guiding access to authentic learning materials and environments
- increasing student language awareness

Authenticity

- letting the students ask for the language help they need
- maximizing the accommodation of student interests
- making a regular connection between learning and the students' lives
- connecting with other speakers of the CLIL language
- using current materials from the media and other sources

Active learning

- students communicating more than the teacher
- students help set content, language and learning skills outcomes
- students evaluate progress in achieving learning outcomes
- favouring peer co-operative work
- negotiating the meaning of language and content with students
- teachers acting as facilitators

<p>Scaffolding</p> <ul style="list-style-type: none">- building on a student's existing knowledge, skills, attitudes, interests and experience- repackaging information in user-friendly ways- responding to different learning styles- fostering creative and critical thinking- challenging students to take another step forward and not just coast in comfort
<p>Cooperation</p> <ul style="list-style-type: none">- planning courses/lessons/themes in co-operation with CLIL and non-CLIL teachers- involving parents in learning about CLIL and how to support students- involving the local community, authorities and employers

Table 4. Core features of CLIL methodology (Mehisto, Marsh and Frigols (2008, p 29)

Annex 4: COVER LETTER FOR THE SCHOOLS' HEAD TEACHER.

Ester Martín Torrego

Email: ester.martor@gmail.com

Estimado/a director/a,

Me dirijo a usted como estudiante del Máster en Enseñanza Integrada de Lengua Inglesa y Contenidos (MEILIC), de la Universidad de Oviedo. En este momento estoy realizando el trabajo Fin de Master bajo el título “La enseñanza de las ciencias en Educación Primaria siguiendo el enfoque metodológico CLIL. Estudio de caso en el tercer ciclo”. El trabajo tiene como objetivo conocer cómo trabajan los profesores en varios colegios bilingües en las aulas de Science de colegios públicos de Valladolid, y valorar, en concreto, los posibles problemas que se dan en el tercer ciclo de Educación Primaria en relación a esta asignatura.

La participación de los maestros de su centro sería de gran relevancia en el marco de mi investigación. Por ello, solicito la posibilidad de pasar el cuestionario adjunto a los profesores que se encuentren dando clase de Science dentro del programa bilingüe en la etapa de Educación Primaria, así como entrevistar brevemente a algún profesor que esté trabajando en el tercer ciclo. Esta posible entrevista serían preguntas del estilo del cuestionario con la intención de recopilar una información más concreta.

A lo largo del estudio, y su posterior publicación, no aparecerá en ningún momento, datos relativos a los centros o a los profesores que permita su identificación. Así pues el compromiso de confidencialidad y anonimato es absoluto y de riguroso cumplimiento.

Muchas gracias de antemano por su colaboración, si tiene cualquier pregunta no dude en ponerse en contacto conmigo.

En Valladolid a de del 2014

Annex 5: SURVEY FOR BILINGUAL PRIMARY EDUCATION TEACHERS

The information you are going to answer will be very helpful for a Master's project from the University of Oviedo in relation to the **Content and Language Integrated Learning (CLIL)** approach. The research is about the methodologies teachers use in Science bilingual classes in Primary Education, especially in the third cycle. The data provided will be treated confidentially and will not be published.

Feel free to answer either in English or in Spanish, and make notes when necessary. Thank you very much in advance for completing this questionnaire. I highly appreciate your time and attention.

ester.martor@gmail.com

1. You are...

Male Female

2. Tick your age range:

<30 30-39 40-49 >50

3. Your mother tongue is...

Spanish English Other (please, say which)

4. How long have you been teaching in bilingual education?

<3 years 3-6 years >6 years

5. Which years have you been teaching bilingual classes in?

Pre-school 1st 2nd 3rd 4th 5th 6th Secondary

6. Which bilingual subjects have you taught?

Science Arts Music P.E. Others

7. Which is the teaching area you are specialised in? (English, Primary, Pre-school...). Have you done further studies? (Grado, Master...)

.....

8. Do you have any specific training in CLIL or bilingualism? In affirmative answers, please, write down which additional training you have done.

No Yes, I did

9. Have you taught Science in years 5th or 6th? If so, do you find it is more difficult to teach in those years than in the lower ones? Why?

No Yes, it was

.....

10. Have you taught Science in Spanish (Conocimiento del Medio)? What differences do you find?

Yes No Differences:

.....

11. What should be the CEFR English level required for teaching in the third cycle of Primary Education?

A1 A2 B1 B2 C1 C2

12. What are the most common problems or challenges teachers encounter when teaching Science through a foreign language in the third cycle?

.....

.....

.....

What, in your opinion, should teachers modify or improve to teach Science through English? In relation to:

Teaching:

Students:

Subject and materials:

13. What is more important in bilingual classes, the content or the foreign language? Why?

.....

.....

14. From 1 to 5, how benefit is the bilingual programme to improve the students' English level?

1 2 3 4 5

15. From 1 to 5, is English a barrier to learn Science?

1 2 3 4 5

16. From 1 to 5, how benefit is the bilingual programme to improve the students' Science level?

1 2 3 4 5

17. What do you think of the science level? Is it lower than when using Spanish?

.....

.....

18. Why do you think the science subject has been benefited with the CLIL approach?

.....

.....

19. Are your students more motivated in Science because of teaching through English?
 Yes No The same
.....
20. Are students more independent in relation to their learning process?
 Yes No The same
.....
21. What should be taught through English? Tick one or both.
 Natural Science Social Science
.....
22. Do you use Spanish during the lesson? When, what for?
 No Yes,
.....
23. How would you describe the communication in your classroom? Tick one or more.
 Students usually use Spanish to talk between them.
 Students sometimes use Spanish to talk between them.
 Students usually use English to talk between them.
 Students usually use English to talk to the teacher.
 Students use English or Spanish to talk to the teacher.
 Students use English all the time.
24. Do your students know the scientific concepts in both languages? Tick one or more.
Yes, we translate the main concepts in the book.
 we work with glossaries.
 but they do it at home.
 but only because the parents have asked to do so.
No, I do not want to use Spanish in the class.
 I do not consider they need to know them in both languages.
 I do not have time to deal with that.
.....
25. From 1 to 5, how important is, in your opinion, to have the same teacher in Science and in English?
1 2 3 4 5

26. In the case you are not the same teacher, how do you coordinate with the English teacher?

.....

27. From 1 to 5, give a score about how difficult do you find these aspects when teaching:

- | | | | | | | | | | | | |
|--------------------------|---|---|---|---|---|-------------------------------------|---|---|---|---|---|
| - Planning lessons. | 1 | 2 | 3 | 4 | 5 | - Evaluation. | 1 | 2 | 3 | 4 | 5 |
| - Finding resources. | 1 | 2 | 3 | 4 | 5 | - Explaining doubts. | 1 | 2 | 3 | 4 | 5 |
| - Teaching. | 1 | 2 | 3 | 4 | 5 | - Preparing exams. | 1 | 2 | 3 | 4 | 5 |
| - The size of the class. | 1 | 2 | 3 | 4 | 5 | - Correcting exams. | 1 | 2 | 3 | 4 | 5 |
| - Specific vocabulary. | 1 | 2 | 3 | 4 | 5 | - Coordination with other teachers. | 1 | 2 | 3 | 4 | 5 |

.....

28. Which of the following strategies do you use when teaching in bilingual classes?

- | | |
|--|--|
| <input type="checkbox"/> Audiovisual material.
<input type="checkbox"/> Non-verbal communication.
<input type="checkbox"/> New technologies.
<input type="checkbox"/> Games.
<input type="checkbox"/> Textbooks.
<input type="checkbox"/> Images
<input type="checkbox"/> Diagrams
<input type="checkbox"/> Summaries | <input type="checkbox"/> My own materials.
<input type="checkbox"/> Foreign Language Assistant teachers.
<input type="checkbox"/> IWB (interactive whiteboard).
<input type="checkbox"/> Hands-on materials.
<input type="checkbox"/> Online platforms (blogs, social networks, web pages, wikis, Edmodo, Moodle...)
<input type="checkbox"/> Others (please, say which)
..... |
|--|--|

29. How do you evaluate your students?

- | | |
|---|---|
| <input type="checkbox"/> Written exams.
<input type="checkbox"/> Oral exams. | <input type="checkbox"/> Students' daily work.
<input type="checkbox"/> Projects |
|---|---|

30. In the case you carry out projects, how are these projects? How are students organised?

.....

31. Do you evaluate both content and English in the subject of Science? How do you do it?

.....

32. Do you penalise errors in the English language in Science? How?

- Yes No

33. What information or training would you find more useful in order to achieve better practices in bilingual classes?

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