

# Students and Teacher's Perceptions and Motivation in a Galician Plurilingual High School: a Study in CLIL Physics and Chemistry

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## **RESUMO**

Nas últimas décadas, a educación en linguas estranxeiras e as súas políticas volvéronse un dos elementos máis significativos promocionados desde a Unión Europea (Cumio de Milán, 1985, Tratado de Maastrich, 1992, MCER, 2001) para atender a realidade multilingüe e plurilingüe dos seus estados membros. Con este propósito, implementáronse diferentes iniciativas nos últimos anos como AICLE (Aprendizaxe Integrado de Contidos e Lingua Estranxeira). En Galicia AICLE introduciuse mediante o *Decreto para o Plurilingüismo 79/2010* e a *Orde do 12 de maio de 2011*. Nembargante, a pesar do crecemento do número de centros plurilingües (Villar, 2016, 2017), non hai estudos sobre a motivación e as percepcións sobre AICLE en institutos galegos plurilingües. Esta tese de doutoramento estuda as percepcións e motivación en relación a AICLE en tres grupos de estudantes de Física e Química AICLE (N=61) e o seu profesor nun instituto plurilingüe nunha cidade galega. Os resultados principais do estudo mostran que o uso do inglés na clase motiva o estudantado debido o seu carácter instrumental (Gardner & Lambert, 1972) e o seu valor extrínscico (Deci & Ryan, 2000). En canto o profesor, a súa motivación é principalmente intrínscica.

## **RESUMEN**

En las últimas décadas, la educación en lenguas extranjeras y sus políticas se han vuelto uno de los elementos clave promocionados desde la Unión Europea (Cumbre de Milán, 1985, Tratado de Maastrich, 1992, MCER, 2001) para atender a la realidad multilingüe y plurilingüe de sus estados miembros. Con este propósito, se han implementado diferentes iniciativas en los últimos años como AICLE (Aprendizaje Integrado de Contenidos y Lengua Extranjera). En Galicia AICLE se ha introducido mediante el *Decreto para el Plurilingüismo 79/2010* y la *Orden del 12 de mayo de 2011*. Sin embargo, a pesar del crecemento del número de centros plurilingües (Villar, 2016, 2017), non hay estudios sobre la motivación e las percepciones sobre AICLE en institutos gallegos plurilingües. Esta tesis de doctorado estudia

las percepciones y motivación en relación a AICLE en tres grupos de alumnos de Física y Química AICLE (N=61) y su profesor en un instituto plurilingüe en una ciudad gallega. Los resultados principales del estudio muestran que el uso del inglés en la clase motiva a los estudiantes debido a su carácter instrumental (Gardner & Lambert, 1972) y a su valor extrínscico (Deci & Ryan, 2000). En cuanto al profesor, su motivación es principalmente intrínscica.

### **ABSTRACT**

In the last couple of decades, foreign language education and its policies has become one of the key points encouraged by the European Union (Milan Summit, 1985; Maastrich Treaty, 1992; CEFR, 2001) so to cater to the multilingual and plurilingual reality in the member states. In order to accomplish this, several initiatives have taken place in the last couple of years such as CLIL (Content and Language Integrated Learning). In Galicia, CLIL has been introduced by the *Plurilingual Decree 79/2010* and the *Orde do 12 de maio de 2011*. However, despite its ever increasing number of plurilingual centres (Villar, 2016, 2017), no CLIL research on motivation and perceptions in Galician plurlingual high-schools has been carried out. This doctoral dissertation studies the perceptions and motivation regarding CLIL in three CLIL Physics and Chemistry students' groups (N=61) and their CLIL teacher in a plurilingual high-school located in a city in Galicia. The main results of the study show that using English in the CLIL classroom motivates students because of its instrumental (Gardner and Lambert, 1972) and extrinsic (Deci & Ryan, 2000) value while the CLIL teacher shows to be overall intrinsically motivated.

### **EXTENDED ABSTRACT**

In the last couple of decades, foreign language education and its policies in Europe has become one of the key points encouraged by the European Union (Milan Summit, 1985; Maastrich Treaty, 1992; CEFR, 2001) so to cater to the multilingual and plurilingual reality

in the member states and boost more than one foreign language learning (at least two languages; White Paper 1995; Commission Staff Working Document Language Competences for Employability, Mobility and Growth, 2012). In order to accomplish this, several initiatives have taken place in the last couple of years such as CLIL (Content and Language Integrated Learning), “a dual-focused educational approach” (Marsh, Mehisto, Wolff & Frigols Martín, 2011, p. 11) whose main purpose is the integration of content and FL in order to achieve predefined levels in both elements.

According to Europe-focused reports (Eurydice, 2006, 2012), CLIL has been implemented in mostly all continent. Spain is one of the countries in which this methodology has been more widespread and different types of research (e.g. longitudinal, case studies) have been carried out in several autonomous communities (e.g. Ruiz de Zarobe & Lasagabaster, 2010; Cherro Semper, 2015; Lofft Basse, 2016; Pérez Cañado & Lancaster, 2017). However, despite its ever increasing number of plurilingual and bilingual centres (Villar, 2016, 2017) thanks to the implemented plurilingual educational policies (*Plurilingual Decree 79/2010, Orde do 12 de maio de 2011, Edulingüe 2020* project) CLIL research in Galicia –specifically, CLIL in secondary education (Bobadilla Pérez & Galán Rodríguez, 2015; San Isidro, 2009, 2010, 2017)– needs to be further studied bearing in mind the specific Galicia sociolinguistic situation.

This doctoral dissertation endeavours to focus on the perceptions and motivation regarding CLIL in three CLIL Physics and Chemistry groups (N=61) and their CLIL teacher in a plurilingual high-school located in a city in Galicia. Although it has been reported that CLIL perceptions are overall positive and the levels of motivation among CLIL students and teachers are high (Fernández Fontecha, 2014; Heras & Lasagabaster, 2015; Lasagabaster & Doiz, 2015, 2016; Pladevall-Ballester, 2015; San Isidro, 2017), this has not been proved in plurilingual centres. Therefore, this study follows a mixed method approach (qualitative and

quantitative data) using three different research tools: (1) students' questionnaire, (2) teacher's interview and (3) systematic classroom observation. The first tool endeavours to collect data on students' perceptions on CLIL as well as whether they are motivated by the methodology. The second tool provides information about the teacher's point of view on some CLIL key issues (both theoretical and practical) as well as his feelings on his CLIL teaching practice. These two research tools are to be contextualised by the systematic classroom observation which focuses on learners' behaviour, the teacher's discourse and classroom dynamics.

The results of the study show that using English in the CLIL classroom motivates students because of its instrumental (Gardner and Lambert, 1972) and extrinsic (Deci & Ryan, 2000) value while the CLIL teacher shows to be overall intrinsically motivated. Furthermore, students' levels of engagement (and competitiveness) rise when they are asked questions related to the language of instruction which is related to the strong impact of academic goals (Covington, 2000) in their levels of motivation. Concerning the results per group, some significant differences were found: while the first two studied groups (Group A & B) are positively predisposed towards CLIL be it for its integrative orientation (Group A) or its extrinsic value (Group B), Group C is the least predisposed towards showing a positive attitude in regards to CLIL, though their perceptions towards English as a FL are at par with their colleagues from the other groups. Therefore, the study proves that affective factors such as motivation as well as perceptions are idiosyncratic elements which need to be studied qualitatively as well as quantitatively in order to provide reliable information based on the classroom reality.

**Keywords:** CLIL, motivation, perceptions, plurilingualism, FL, classroom reality, CAR.



## **PREFACE**

Although they are a crucial element in the learning process, affective factors have started being studied only recently, probably due to the fact that they are difficult to study qualitatively. Motivation is considered one of the most significant elements within students' affective filter as well as playing a part in their cognitive processes. Even though motivation in the traditional FL class has been widely studied (Clement, Dörnyei & Noels, 1994; Dörnyei, 1990, 1994; Lasagabaster, Doiz & Sierra, 2014; Henscheid, 2015), motivation in CLIL settings has only been recently researched in Spain (Lasagabaster, 2011; Doiz, Lasagabaster & Sierra, 2014; Fernández Fontecha, 2014; Fernández Fontecha & Cangas Alonso, 2014; Lagasabaster & Doiz, 2015; Sylvén & Thompson, 2015, San Isidro).

As CLIL in Spain is a somewhat recent phenomenon (for educational standards), research has only gone so far: new CLIL classroom realities are born every day so it is important to pay attention to context in order to cater to these realities. Concerning Galicia, some research has been carried out in regards to bilingual sections (Bobadilla Pérez & Galán Rodríguez, 2015; González Gándara, 2015; San Isidro, 2009, 2010, 2017), but none has studied so far plurilingual centres. Therefore, in order to comply with this educational reality and bearing in mind that motivation is a powerful tool in learning processes, the aims of this study are (1) to provide a theoretical background on key issues regarding CLIL and motivation; (2) to study motivation in a Galician CLIL section; and (3) to give a set of guidelines to improve motivation in CLIL.

Classroom reality and academic research should not be separated entities but two parts of a whole with a common purpose: to improve education, teaching and learning. This is the main principle this doctoral dissertation endeavours to follow.



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## **RESUMO DA TESE EN GALEGO**

Nas últimas décadas, a educación en linguas estranxeiras e as súas políticas volvéronse un dos elementos máis significativos promocionados desde a Unión Europea (Cumio de Milán, 1985, Tratado de Maastrich, 1992, MCER, 2001) para atender a realidade multilingüe e plurilingüe dos seus estados membros. Con este propósito, puxéronse en práctica diferentes iniciativas nos últimos anos como AICLE (Aprendizaxe Integrado de Contidos e Lingua Estranxeira). AICLE defínese como “unha aproximación educativa de dobre sentido na que unha lingua adicional se usa para a aprendizaxe e ensinanza de contido e lingua co obxectivo de promover o dominio de contidos e lingua a niveis predefinidos [a miña tradución]” (Marsh, Mehisto, Wolff & Frigols Martín, 2011, p. 11).

En xeral, enténdese que a metodoloxía AICLE se basea na aprendizaxe e ensinanza de contidos e lingua, mais esta definición pode considerarse moi ampla, xa que logo outras metodoloxías e enfoques educativos como a *Instrucción Baseada en Contidos (CBI)*, *Inglés como Lingua Académica (EAL)* ou *Inglés para Fins Específicos (EMI)* teñen como punto de partida a integración de contidos e lingua. Non obstante, AICLE presenta outros principios que a distingue doutras metodoloxías e enfoques educativos:

1. A lingua úsase para aprender contido da materia, mais tamén é necesario aprender a lingua para entender e comunicarse.
2. A lingua utilizada determínase tendo en conta contido polo que elementos como o vocabulario, as estruturas lingüísticas e as habilidades dependerán dos contidos da materia.
3. En relación coa competencia comunicativa e o MCER (2001), a fluidez na fala é considerada máis importante que a gramática e a precisión lingüística en xeral.

Esta énfase na competencia e a fluidez comunicativa vén sendo común nos últimos avances metodolóxicos en canto ao ensino e aprendizaxe de linguas estranxeiras. Atribúese á

metodoloxía AICLE a idea de ser un contexto favorable que promove un uso natural e real da lingua pola súa faceta comunicativa, deixando de lado o enfoque máis ‘artificial’ das clases de lingua estranxeira, desta forma séguense os principios comunicativos de Savignon (2004).

A integración de lingua e contido en AICLE resúmese en catro piares (Coyle et al. 2010):

- Comunicación: usar a lingua para aprender e aprender a usala ao mesmo tempo.
- Cognición (procesos de aprendizaxe e pensamento): desenvolver estratexias cognitivas que unen conceptos, coñecementos e lingua.
- Cultura (entendemento intercultural e cidadanía global): promover o coñecemento e a integración de diferentes perspectivas ademais de tolerancia para desenvolver consciencias individuais e pluriculturais ademais de habilidades para a aprendizaxe de por vida.
- Contido (contido da materia): fomentar o coñecemento, as habilidades e a comprensión dos temas específicos do currículo; é o eixo central da experiencia AICLE que determina o proceso de aprendizaxe.

Estes conceptos deben ser comprendidos non como unidades illadas senón como elementos interrelacionados e pezas integradas da metodoloxía AICLE. Non obstante,, o contexto da aula ha de terse en conta en todo momento, xa que logo as idiosincrasias presentes nos grupos de alumnos AICLE fan que sexa necesaria unha adaptación individualizada. Aínda así, é certo que algúns conceptos son comúns a todas as seccións AICLE, por exemplo, é improbable que “o nivel de lingua dos alumnos estea á par do seu nivel cognitivo [a miña tradución]” (Coyle et al. 2010, p. 43).

De acordo con estudos a nivel europeo (Eurydice; 2006, 2012), España é un dos países europeos con máis proxección en canto a aplicación de AICLE en todo tipo de ensinanzas obrigatorias. Polo tanto, non é de estrañar que os resultados das devanditas clases bilingües ou AICLE sexan motivo de estudo nos últimos anos en diferentes comunidades

autónomas coma Andalucía (Lorenzo, 2010; Lorenzo & Rodríguez, 2014; Pérez Cañado & Lancaster, 2017) e o País Vasco (Alonso, Grisaleña & Campos, 2008; Ruiz de Zarobe, 2008; Ruiz de Zarobe & Lasagabaster, 2010; Lasagabaster & Doiz, 2015) entre outras. Non obstante, o número de estudos sobre AICLE en centros educativos galegos é bastante escaso (Bobadilla Pérez & Galán Rodríguez, 2015; González Gándara, 2015; San Isidro, 2009, 2010, 2017), sobre todo tendo en conta o crecemento do número de centros plurilingües (Villar, 2016, 2017) nesta comunidade autónoma.

En Galicia, AICLE introduciuse mediante o *Decreto para o Plurilingüismo 79/2010* e a *Orde do 12 de maio de 2011*. O *Decreto 79/2010* establece que un terzo das materias non-lingüísticas no ensino obrigatorio deben ser impartidas nunha terceira lingua diferente do galego e castelán, linguas oficiais da comunidade. Isto vén especificado na *Orde do 12 de maio de 2011* que responde a aplicación do anterior decreto nas chamadas seccións bilingües e seguindo a metodoloxía AICLE: polo menos a lingua estranxeira utilizarase nun 50% nas seccións bilingües e os alumnos que participen nestas deberán estar matriculados na materia lingüística pertencente a lingua utilizada na sección bilingüe.

De acordo co contexto AICLE galego, é necesario facer unha distinción entre centros bilingües e centros plurilingües:

- Centros bilingües: é o tipo de centro máis estendido na comunidade en canto o uso da metodoloxía AICLE (4145 seccións bilingües no ano académico 2017-2018; Villar, 2017). Nalgúns niveis académicos ofértanse materias non lingüísticas utilizando esta metodoloxía. A participación nestas seccións por parte dos alumnos é voluntaria: unha alternativa non-AICLE ofértase para aqueles que non desexen formar parte dela.
- Centros plurilingües: no ano académico 2017-2018, 322 centros en Galicia teñen a categoría de centros plurilingües (Villar, 2017). Os centros plurilingües seguen os principios do *Decreto 79/2010* e aplican a metodoloxía AICLE en todos os seus niveis

educativos de forma que, polo menos, unha materia non-lingüística en cada nivel sexa impartida na lingua estranxeira. Neste caso, os alumnos non poden escoller entre ter a materia na lingua estranxeira ou nunha das linguas oficiais, xa que logo tódolos grupos do mesmo nivel académico (agás os de NEE) seguen a metodoloxía AICLE.

É importante facer esta distinción, dado que toda a investigación realizada ata o momento sobre AICLE en Galicia céntrase en centros bilingües (Bobadilla Pérez & Galán Rodríguez, 2015; González Gándara, 2015; San Isidro, 2009, 2010, 2017). A pesares do incremento no número de centros plurilingües (o número de centros plurilingües duplicouse de 2012 a 2016, Villar, 2016) non hai estudos sobre as seccións AICLE en colexios ou institutos plurilingües.

O feito de que as seccións AICLE en centros plurilingües sexan obrigatorias pode supoñer un cambio en canto a motivación e as percepcións do alumnado e profesorado AICLE. Aínda que os estudos realizados nas seccións bilingües amosan que (1) os alumnos e profesores están máis motivados nas clases AICLE que os seus compañeiros non-AICLE e (2) as súas percepcións sobre a clase son positivas (Fernández Fontecha, 2014; Heras & Lasagabaster, 2015; Lasagabaster & Doiz, 2015, 2016; Pladevall-Ballester, 2015; San Isidro, 2017). Unha opinión estendida pola comunidade educativa xustifica estes resultados no feito de que só os alumnos academicamente mellores forman parte das seccións bilingües. Polo tanto, é necesario levar a cabo estudos sobre a motivación e as percepcións sobre AICLE en institutos galegos plurilingües para responder e afondar na realidade educativa de AICLE en Galicia.

Esta tese de doutoramento estuda as percepcións e motivación en relación a sección AICLE en tres grupos de estudantes de Física e Química (N=61) e o seu profesor nun instituto plurilingüe nunha cidade galega. Este estudo céntrase en cumprir tres obxectivos e as súas preguntas de investigación:

- Obxectivo 1: aportar un contexto teórico en elementos chave sobre AICLE e motivación.

Pregunta de investigación 1: Satisfán as políticas lingüísticas galegas aos principios de AICLE?
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Pregunta de investigación 2: Aplícanse as políticas plurilingües nas seccións AICLE estudadas?
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Aínda que o marco teórico de AICLE deseñado polos investigadores presenta unha realidade homoxénea, algúns dos estudos de casos presentan diferentes realidades, probablemente debido aos diferentes contextos de aula. É probable que conceptos tales como a motivación e as percepcións (influenciados por elementos contextuais e individuais) estean presentes de diferentes formas na clase AICLE. Polo tanto, unha revisión destes conceptos é necesaria para contextualizar a análise de resultados da información recollida na aula AICLE.

- Obxectivo 2: estudar a motivación nunha sección AICLE galega.

Pregunta de investigación 3: Que percepcións teñen os estudantes e o profesor cara a sección AICLE?
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Pregunta de investigación 4: Están os estudantes e o profesor AICLE motivados? Se é así, que tipo de motivación presentan?
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Pregunta de investigación 5: Hai diferenzas significativas en torno a motivación e percepcións sobre AICLE entre os tres grupos estudados? Se é así, por que?
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Nas últimas décadas, a motivación estudouse desde o campo da psicoloxía e educación con Gardner (1985) como un dos seus principais precursores. Debe considerarse o gran impacto que a motivación ten no ambiente da clase, as percepcións e os resultados do alumnado, polo que a motivación do alumnado nas seccións AICLE pode ser un elemento de gran peso. Ata o momento, só se realizou un

estudo lonxitudinal levado a cabo nun instituto bilingüe galego (San Isidro, 2017), así que é necesario seguir afondando no tema en centros plurilingües.

- Obxectivo 3: propoñer unhas directrices para mellorar a motivación en AICLE.

Pregunta de investigación 6: Que elementos deberían ser revisados para mellorar as seccións AICLE en canto a motivación?

O propósito deste estudo baséase na idea de que a investigación académica é un instrumento para a mellora da sociedade, neste caso, AICLE en Galicia. Polo tanto, preséntanse unhas directrices sobre como mellorar a motivación do alumnado AICLE seguindo a observación directa realizada na clase e a información recollida a través das enquisas ao alumnado e a entrevista ao profesor AICLE.

Para acadar estes obxectivos, este estudo divídese en oito capítulos:

- Capítulo 1: presenta o estado da cuestión facendo unha revisión dos resultados de investigación nos dous países europeos (aparte de España) con máis traxectoria e investigación en AICLE. Explica por que a motivación en AICLE é unha liña significativa que se ten que estudar tendo en conta a situación AICLE actual en Galicia. Presenta tamén os obxectivos, as preguntas de investigación do estudo e a estrutura deste.
- Capítulo 2: este apartado describe AICLE como un fenómeno a nivel mundial e contextualiza de forma diacrónica a súa orixe ao tempo dos arcádeos (Martínez, 2011) e aos máis recentes proxectos bilingües de Canadá e Estados Unidos (Daton-Puffer, 2007). Isto contextualízase no panorama plurilingüe europeo das últimas décadas e as iniciativas para promover o plurilingüismo. Ademais os resultados de AICLE preséntanse facendo unha revisión da literatura académica e popular para ter unha visión máis global do fenómeno AICLE. A definición de AICLE, os seus principios e a súa aplicación na educación secundaria española descríbense neste capítulo.



- Capítulo 3: céntrase no contexto español e galego en canto a políticas lingüísticas para explicar o contexto sociolingüístico e educativo destas rexións. Para isto, o capítulo baséase no marco legal español (Constitución Española, 1978) e galego (Decreto de Autonomía, 1983; Decreto 79/2010) ademais de afondar no concepto de bilingüismo (Lorenzo, Trujillo & Vez, 2011) e a situación sociolingüística en Galicia. En canto ao eido educativo, o capítulo presenta unha panorámica da aprendizaxe de linguas estranxeiras en educación secundaria, a aplicación de AICLE en Galicia e os retos actuais desta metodoloxía na comunidade autónoma.
- Capítulo 4: este capítulo presenta os elementos teóricos chave deste estudo (motivación, cognición e AICLE). En primeiro lugar, os principais enfoques teóricos sobre motivación preséntanse prestando atención a conceptos como a orientación integrativa e instrumental (Gardner & Lambert, 1972), a motivación intrínseca e extrínseca (Deci & Ryan, 2000), as atribucións causais (Heider, 1958; Weiner, 1986) e a ‘goal theory’ (Covington, 2000). Outros elementos relacionados co proceso cognitivo na L3 como a conciencia da linguaxe e os ‘attractor stages’ (Waninge, 2014) son considerados para contextualizar os procesos metacognitivos da aprendizaxe e percepcións do alumnado. Engádesse información sobre os factores afectivos como a ansiedade e o aburrimiento para presentar elementos que poden afectar ao contexto individual dos alumnos. Finalmente, preséntase un apartado baseado na literatura e investigación feita ata agora sobre as percepcións do alumnado e profesorado AICLE en España.
- Capítulo 5: este capítulo trata as consideracións metodolóxicas desta tese de doutoramento. Explícanse as razóns polas que se escolleu este grupo de alumnos (2º ESO, Física e Química, instituto plurilingüe) e a metodoloxía seguida para contextualizar o estudo en termos prácticos. Resúmense as características principais

dos dous métodos de investigación utilizadas no estudo —CAR (*Classroom Action Research*) e CA (*Conversational Analysis*)— contextualizados na súa aplicación a SLA (*Second Language Acquisition*) e AICLE. Apórtase unha descrición dos instrumentos de investigación (enquisas, entrevista e observación sistemática), o proceso de recollida de información e o contexto (cidade, instituto, participantes) para explicar a relevancia destes no estudo e nos resultados finais.

- Capítulo 6: a información conseguida grazas aos instrumentos de investigación durante a observación directa da aula e a análise desta preséntase neste capítulo. A información foi sistematizada por medio de notas de campo e elementos gráficos que axudan a proporcionar unha imaxe obxectiva da realidade da aula en relación á motivación e ás perspectivas do alumnado. Ademais recóllese neste apartado a información referida á entrevista ao profesor e a observación sistemática da clase.
- Capítulo 7: A información presentada anteriormente utilízase neste capítulo para responder as preguntas de investigación do Capítulo 1. Así mesmo, os resultados obtidos considéranse para propoñer algunhas medidas de mellora dos niveis de motivación na sección AICLE observada, cumprindo así o Obxectivo 3 deste estudo.
- Capítulo 8: o último capítulo céntrase nas conclusións do estudo tras a finalización de todo o proceso de investigación. Isto permite reflexionar no desenvolvemento e nos resultados do estudo como, por exemplo, na idoneidade da metodoloxía empregada ou nos resultados inesperados. Ademais propóñense novos aspectos para complementar o estudo e outras liñas de investigación para mellorar as seccións AICLE e a motivación do alumnado plurilingüe.

En canto aos resultados do estudo, aprender inglés e poñelo en práctica son as principais forzas de motivación no alumnado AICLE estudado. Isto está relacionado co concepto de orientación instrumental (Gardner & Lambert, 1972), xa que logo os alumnos cren que saber

inglés é importante polo seu status de *lingua franca* e a súa utilidade para o seu futuro como alumnos e traballadores: isto responde á orientación instrumental e tamén a motivación extrínseca (Deci & Ryan, 2000) en relación a aprendizaxe de inglés. Os tres grupos de alumnos inciden no uso do inglés como fenómeno social relacionado co ‘aprendizaxe entre iguais’, o que presenta un panorama favorable para a integración do inglés en contextos non académicos. É interesante que o uso non académico da lingua estranxeira aparece na interacción entre iguais (os alumnos utilizan o inglés cos seus amigos), mais os números non son definitivos no que se refire ao uso do inglés de forma individual por parte dos participantes do estudo (ex. ver series de televisión en inglés).

No referente ás percepcións do alumnado en relación á sección AICLE, os niveis de satisfacción son xeralmente altos. A maioría amosa boa disposición para escoller a sección AICLE no caso de que fose opcional (como é o caso dos centros bilingües), agás no Grupo C. É relevante comparar estes datos con outros sobre as percepcións do alumnado sobre o nivel de dificultade dos contidos debido á lingua empregada: un alto número de participantes (Grupo A e C) pensan que o inglés fai a aprendizaxe dos contidos da materia (Física e Química) máis difícil.

En canto ás percepcións do profesor AICLE, este avaliou a súa experiencia na sección de forma positiva. Tras analizar a entrevista ao profesor e observar o seu traballo diario na aula constátase o seu compromiso coa sección AICLE: amosa unha boa disposición a preparar de forma máis extensa os contidos da sección AICLE. Isto é consecuencia da motivación do profesor cara a lingua inglesa, xa que logo admitiu que aprender e practicar o inglés son accións motivadoras para el (motivación intrínseca: Deci & Ryan, 2000). Así mesmo, salientou a idoneidade da materia de Física e Química (materia científica) para utilizar a metodoloxía AICLE debido ao feito de que o inglés é a lingua predominante no ámbito científico. Isto responde a orientación instrumental (Gardner & Lambert, 1972) por

parte do profesor ademais da súa motivación intrínseca. En xeral, a súa actitude positiva cara a sección AICLE e a súa metodoloxía responde a outros estudos feitos sobre o tema (Infante, Benvenuto & Lastrucci, 2009; Méndez García, 2014; Pladevall-Ballester, 2015; Pérez Cañado, 2016; San Isidro, 2017).

En relación á observación sistemática, a pesares das diferenzas entre grupos, hai un patrón común: a interacción coa lingua. Os tres grupos presentan un alto nivel de interacción coa lingua en relación co léxico específico da materia, que o profesor preguntaba a través de traducións ou parafraseando os termos: os alumnos contestaban rapidamente a estas preguntas e incluso púidose observar certo nivel de competitividade. Non obstante, é necesario destacar que o uso oral da lingua por parte dos alumnos era limitado a respostas breves debido á natureza formulaica da materia.

Tras revisar a literatura sobre o tema e analizar a información recollida no estudo de campo, as directrices céntranse en catro puntos:

1. Materiais e deseño de actividades: o *input* de contido e lingua debe ter en conta o continuum de familiaridade e novidade (Coyle et al., 2010, p. 95). O contexto e os gustos dos alumnos poden ser un instrumento importante para crear actividades que fomenten o seu interese. Outro punto a ter en conta é cambiar a natureza das actividades facéndoas máis interactivas; por exemplo, utilizando a pizarra dixital.
2. Lingua estranxeira: dado que os alumnos comentaron que o uso da lingua estranxeira dificultaba a aprendizaxe dos contidos (aínda que non deron mostra de dificultades lingüísticas durante a observación directa), propóñense actividades nas que a lingua se traballa de forma explícita (ex. dicionario de termos, nube de palabras).
3. Dinámica de clases: propónse o fomento da aprendizaxe colaborativa a través de tarefas en grupo, non só nas prácticas de laboratorio levadas a cabo polos alumnos,

senón tamén nas clases teóricas. Desta forma, promoverase a interacción do alumnado ademais do uso da lingua estranxeira.

4. Ensinanza de pluriliteraturas para a aprendizaxe: baseado no conceptos de ‘self-efficacy’ e na idea de aprendizaxe significativo, propónse que o alumnado reflexione de forma crítica sobre o seu propio proceso de aprendizaxe a través de autoavaliacións e impulsando a retroalimentación entre iguais (*peer-feedback*). Tamén é necesario estender a idea de que os erros son unha parte natural do proceso e facer posible que os alumnos expresen as súas emocións (Mehisto et al. 2008) ou experiencias como un elemento significativo a ter en conta na aprendizaxe.

Este estudo conclúe que os alumnos de centros plurilingües amosan algún tipo de motivación cara ás seccións AICLE, aínda que é preciso realizar máis investigacións para determinar se as conclusións obtidas poden xeneralizarse a outras poboacións escolares (plurilingües). Está comprobado que o profesor AICLE está moi motivado na súa tarefa docente centrada nesta metodoloxía. En termos xerais, os resultados principais do estudo mostran que o uso do inglés na clase motiva ao alumnado debido ao seu carácter instrumental (Gardner & Lambert, 1972) e ao seu valor extrínseco (Deci & Ryan, 2000). En canto ao profesor, a súa motivación é principalmente intrínseca.



## **CHAPTER 1: INTRODUCTION TO THE STUDY**

It is a truth universally acknowledged that foreign language proficiency in Spain has been met with reticence at best and derision at worst. Despite the language-based initiatives which have been taken since the middle of the 20<sup>th</sup> century in Spain, the public's opinion about the levels of foreign language proficiency (mostly English) points out to a perceived low level in the foreign language. It has been brought to attention that the traditional methodologies such as the popular Grammar-Translation method used in the last century could have set a precedent on how foreign language is still being taught nowadays.

Even though a new emphasis on the communicative competence has been brought about in foreign language (from now on FL) classes due to the rising importance of speaking a foreign language in a globalised world be it for recreational or professional reasons, it has come to attention that the FL classroom is not the only convenient school-based environment to improve foreign language. In fact, non-linguistic subjects have adapted their language of instruction to a foreign language in what is widely known as the *Content and Language Integrated Learning* methodology (from now on CLIL).

Although the implementation of this type of methodology is not a recent phenomenon (see Chapter 2.1), CLIL has been born out of the need to cover a different foreign language reality with content and language intertwined as the main pillars of the learning process. These two concepts have proved to be the key elements in which CLIL stands, though these should not be understood as separate entities in the educational process but joined elements in the learning practice; thus, CLIL is often defined as a “dual-focused educational approach” (Marsh, Mehisto, Wolff & Frigols Martín, 2011, p. 11). This emphasis on duality in CLIL differs from other previous methods in which content and language were used such as CBI

(*Content Based Instruction*) where content is a mere tool to reach the ultimate goal, that is, language learning (Dale & Tanner, 2012).

Even though the learning aims of CLIL are to do with content and language mastery, these two elements are represented or used differently in the classes and subjects where this methodology takes place. This has led to a wide interpretation of what CLIL stands for and how this methodology should be implemented; hence, CLIL is often referred as an ‘umbrella term’ whose implementation is to be defined by multiple factors, both contextual and individual. This heterogeneity has resulted in a whole range of CLIL scenarios and realities which have been and still are accounted in academic literature and research. For these reasons, CLIL has been an object of study in both national and international contexts; both have been considered in this study and proposal.

### **1.1. State of the Art**

Even though the use of a foreign or second language as the language of instruction is not a recent phenomenon (e.g. Latin as the language of instruction in schools and universities), CLIL is said to have its origins in America, most specifically in: (1) Canada and its immersion programmes in French (an official language) for English-native speaking children; and (2) the CBT methodology used to teach English to immigrant children in the US in the 1980’s. Furthermore, the German-French grammar schools in Europe as well as what was termed ‘bilingual education’ in both continents set the basis for CLIL in Europe (Dalton-Puffer, 2007).

CLIL around Europe has been extensively studied in the last couple of decades “from North (Finland) to South (Italy), and from East (Bulgaria) to West (Spain)” (Pérez-Cañado, 2012, p. 319). As CLIL sections have been born out of the sociocultural and linguistic needs of the EU (Eurydice, 2006; 2012), it is no surprising much research has been done on their



effectivity and practice. It has been pointed out by the Eurydice reports (2006; 2012) that most European countries have had some kind of CLIL provision with different ways of implementation and outcomes. Among those countries with extended and researched CLIL tradition, Finland and Austria rise as two of the most popular. This is partly due to their extended L2 teaching tradition, their CLIL ‘success’ and their educational context. Furthermore, the extensive research done on these countries also answers to important CLIL researchers in these areas: Marsh (Finland) and Dalton-Puffer (Austria).

### *Finland*

At the beginning of the 1990’s the term Mainstream Bilingual Education (MBE) was used in Finland in order to refer to what would become CLIL (Marsh, 2013, p. 63). According to Jäppinen (2005, p. 149), Finland is one of the CLIL pioneers in mainstream education with 8% of primary education and 15% of secondary education schools in 1996 using a foreign language as the language of instruction. In regards to the Finnish context at the time, Marsh (2013) writes that:

Finland was experiencing a major economic crisis due to a debt-based economy boom in the 1980’s, leading to a banking crisis in 1990, and severe austerity measures introduced during 1990-1993. The situation was a microcosm of the European sovereign debt crisis of 2008 onwards. Internationalisation strategies were rapidly deployed and Finland invested heavily in education and innovation. Partial teaching in English was one of the outcomes. (p. 63)

The focus on bilingual education was supported by Marsh in the coinage of the term CLIL (1994); in addition to this, Marsh worked and created the theoretical framework such as in *Profiling European CLIL Classrooms* (Marsh, Maljers & Hartiala, 2001) and *The European Dimension: Actions, Trends & Foresight Potential* (Marsh, 2002). This provided a common

research background in regards to the CLIL dimensions along with initial feedback on the CLIL practice in Europe. Along with Marsh, Pérez-Cañado (2012, p. 320) points out other Finnish authors who have contributed to CLIL research addressing recurrent questions in CLIL such as L1 and L2 development, participants' attitudes and subject learning.

Among these, Pérez-Cañado (2012) refers to Bergroth's research (2006) on the effects of CLIL with Swedish as the language of instruction (L2) and English as a L3. The results were favourable dually; CLIL immersion students outperformed their non-CLIL counterparts in all three languages (Finnish, Swedish and English) and their content-learning has not been threatened by the use of the L2 (2006, pp. 132-133). In regards to L2 development, Järvinen (2005) is also mentioned in Pérez-Cañado (2012, p. 321) as a researcher on L2 syntax (subordination and relativization) where he found out "significant differences in favour of the bilingual group in the acquisition of relativization, as it produced significantly longer, more complex, and more accurate sentences" (2012, p. 321).

Related to cognitive issues in the CLIL classroom, Jäppinen (2005) stands out in the Finnish context with her study on the thinking and learning processes of mathematics and science in CLIL sections. The study was carried out on two groups: a CLIL (335 learners) and a non-CLIL (334 learners) group. The final results were that, even though that learning in CLIL environments seemed to more demanding than non CLIL settings at the beginning, "Finnish CLIL environments support thinking and content learning, in particular, in situations where the learner has to compare different concepts and meaning schemes with each other" (2005, p. 163).

Affective factors such as motivation have recently become a matter of research into the CLIL classrooms: Seikkula (2007) points out in her study of CLIL and non CLIL students (217 pupils) that, while CLIL pupils were strongly motivated towards CLIL learning and

achievement in Finnish was not negatively affected, CLIL students had a low self-concept of their own foreign language skills (2007, p. 339). In order to combat this, positive feedback on the teacher's side is encouraged (2007, p. 339). In fact, in the last years, assessment issues in Finnish CLIL settings have been dealt and some research has been made such as Wewer's (2013) where the results showed that:

[1] assessment and feedback in CLIL needs to be reorganised [2] pupils and parents wish to be informed of the progress in the additional language in reference to the learning objectives. This implies that CLIL teachers should arrange more functional language use situations for pupils in which they can exhibit their language skills, and teachers should practice more systematic observation and data gathering of the progress made in language development [3] it is very important for pupils to get constructive and direct feedback on their emerging (academic) learner language in order to encourage them to use the TL. (pp. 84-85)

Regarding CLIL teachers, their attitudes and their practices, some research has been produced, such as Roiha (2014), who studied the teacher's perception of students with special needs in the CLIL classroom and "how to support pupils with special needs in CLIL education by means of differentiation" (2014, p. 1).

However, Finnish CLIL is not only studied on its own, but it has been researched in other prolific CLIL context such as the Austrian and Spanish CLIL environment (Llinares & Dalton-Puffer, 2015), where students' use of evaluative language was studied. Furthermore, Austrian CLIL (Dalton-Puffer & Nikula, 2006) was also researched in terms of the directives used by both teachers and students in these two countries, concluding that the specific conditions of classroom discourse affect the CLIL language environment.

*Austria*

The multilingual Austrian sociolinguistic setting is defined by German, a dominant national language, but also by the constitutional rights of minority languages which are national languages across the Austrian borders (Czech, Hungarian, Slovenian and Croatian) (Dalton-Puffer, 2007, p. 45). In regards to foreign language teaching initiatives, the political climate of the 1990s was favourable due to Austria's accession to the EU; this led to different FLT initiatives: (1) early foreign language learning in grade 1 and 2 of elementary education; (2) fully-fledged bilingual school programmes at some locations; and (3) *Fremdsprache als Arbeitssprache* (FsAA- Foreign Language as a Working Language) (2007, p. 46).

In regards to CLIL implementation in Austria, Dalton-Puffer (2007, p. 46) defines it as a grassroots movement with English as the dominant language of instruction, and points out the non-restrictive nature of the formal provisions regarding the use of foreign languages—hence, providing the opportunity to experiment with different variants of CLIL (2007, p. 47). Furthermore, the CLIL teachers' profile needs to be accounted for: they are usually in the middle of their career and with extensive experience but motivated enough to look for a new challenge, and whose gratification “is almost exclusively symbolic [...] deriving largely from meeting a professional challenge successfully. There are no financial rewards, no reduced teaching hours and sometimes not even extra funds for additional teaching materials” (2007, p. 47).

Concerning the research carried on in Austria on CLIL, most has been done in the shape of practitioners' action research and with emphasis on the teaching of content subjects through English, the language of instruction (2007, p. 48). The fact that many of the research practices have followed the CAR methodology could be due to a “lack of nationwide statistical information on the matter” (2007, p. 47). This makes difficult to create generalisations about the CLIL phenomenon in Austria. In regards to CLIL Austrian research,

Pérez-Cañado (2012) points out that it has focused mainly on lexical proficiency and narrative competence, but she also highlights some common flaws in some studies (Ackerl, 2007; Hüttner & Rieder-Bünemann, 2007, 2010; Seregély, 2008) such as the lack of statistical operations and not guaranteeing homogeneity of experimental and control cohorts (2012, p. 325).

Even though it is difficult to draw lines on Austrian CLIL research due to the variety of specific action research studies, four main areas were defined by Dalton-Puffer, Faistauer & Vetter (2011, p. 196) taking into consideration the CLIL research done in Austria from 2004 and 2009:

1. CLIL implementation surveys: no comprehensive survey of general CLIL practices in Austria had been commissioned at the time the study took place, even though they show a good predisposition towards an overall evaluation. In their study of Austrian CLIL research Dalton-Puffer et al. (2011, p. 196) have found out two common facts: a) unpredictability of CLIL provision due to contextual specificity, and b) tension between the practitioners' wishes for a clear structure and aims contrasting with their autonomy in teaching and planning due to a lack of policy guidelines.
2. Learning outcomes: different studies have been made on varied learning outcomes such as aspects of written language competence (Jexenflicker & Dalton-Puffer, 2010, p. 169) where CLIL students outperform their non CLIL counterparts in the area of lexico-grammar, vocabulary range and orthographic correctness; and improvement on students' affective level such as creativity and risk-taking (Mewald, 2004, 2007) among others (Dalton-Puffer et al., 2011, p. 197).
3. Classroom discourse and learning processes research: from 2004 to 2009 two book-length compilations on the conditions of language use in a CLIL/EMI classroom were

presented (Dalton-Puffer, 2007; Smit, 2008 (2010)). However, some others were presented later where Austrian CLIL practices were studied as well as other European CLIL classrooms (Dalton-Puffer, 2010; Nikula, Dafouz, Moore & Smit, 2016).

4. Didactics of CLIL: in regards to didactic principles that support content and language integration, Dalton-Puffer et al. (2011) point out Orkisz Lang's study (2009) focused on inquiry-based teaching where an "elaborate grid of CLIL inquiry-based teaching criteria on the language, content and learning dimension" (Dalton-Puffer et al., 2011, p. 198) is provided.

Due to the highly contextualized Austrian CLIL programmes and the many CAR studies, it is challenging to provide a general overview of the CLIL results in Austria but it is worth noting that most of the research done in Austria present positive results in CLIL programmes as a whole. Nevertheless, "[i]nformation on contexts where language management regarding CLIL is more clearly present, such as the Netherlands or some Spanish regions, would add valuable information on how the triangular relationship of management, policy and practice" (Hütner, Dalton-Puffer & Smit, 2013, p. 281).

The Spanish research on CLIL (see Chapter 3 & 4) has grown exponentially over the last years in order to answer to the new educational reality and the different contexts found in the Spanish territory. Longitudinal projects on CLIL initiatives and issues have been presented in different autonomous communities such as Andalucía (Lorenzo, 2010; Lorenzo & Rodríguez, 2014; Pérez Cañado & Lancaster, 2017) and the Basque Country (Alonso, Grisaleña & Campos, 2008; Ruiz de Zarobe, 2008; Ruiz de Zarobe & Lasagabaster, 2010; Lasagabaster & Doiz, 2015) among others. These along the doctoral dissertations presented in the last couple of years (Evnitskaya, 2012; Vallbona González, 2014; Cherro Semper,

2015; Lofft Basse, 2016; San Isidro, 2017) have shown the Spanish CLIL panorama throughout quantitative and qualitative data gathered in the CLIL classrooms.

Different perspectives have been taken in these studies in regards to methodology (e.g. formal testing, classroom observation, interview-based research), aims (e.g. language use, language competency, cognitive factors) and context (e.g. urban, rural, bilingual, monolingual). However, despite the ever increasing research on different CLIL aspects, this has not been enough to improve these sections at school level and more research needs to be done to provide to the ever changing Spanish and Galician reality.

The motivation behind this doctoral dissertation is to contribute to this research on CLIL in Galicia bearing in mind that this methodology is still at its early stages of implementation and account for the changes which may arise from the Galician linguistic panorama from a practical ‘in-classroom’ perspective. It is significant that CLIL in this autonomous community is influenced by the linguistic policies related to both Galician and plurilingualism: the *Decree 79/2010* and *Edulingüe2020* (see Chapter 3.2) are proof of the language boost carried out from the autonomous government. This has led to a refashioning of education-based dynamics in educational institutions (e.g. language policies), schools (management of the CLIL sections), teachers (further training) and students (issues on adapting to the methodology). Furthermore, this reality has brought about new needs which need to be covered by different institutions such as CLIL-based teacher training at universities.

Research has also been influenced by these issues and some studies have been carried out in Galician high-school CLIL (San Isidro, 2009, 2010, 2017; González Gándara, 2015). These have taken students and teachers from bilingual high-schools as study participants. However, in the last couple of years the number of plurilingual centres has risen; thus, this

reality needs to be considered: while bilingual centres offer CLIL sections in some subjects and academic years and students' participation is voluntary, plurilingual centres offer mandatory CLIL sections in all their academic levels. This compulsory uptake in the plurilingual centres to CLIL may play a significant role in students' attitudes and motivation. It has been widely accounted the importance of affective factors in the FL learning process (see Chapter 4.3); therefore, these issues should not be forgotten in this new Galician plurilingual-conscious context as they play a key role in the implementation of CLIL and students' learning process, elements which have been considered in this study.

Concerning the inner structure of these pages, this chapter presents the initial considerations of the study to give a comprehensive overview of the topic of this doctoral dissertation. Firstly, some justification on the topic is given (1.2) is provided. Then the thesis structure (1.3) is presented followed by the main aims of the study (1.4).

## **1.2. Why Motivation in CLIL?**

The last decades have seen to unprecedented changes in the educational systems across Europe. The multilinguistic and multicultural European Union has endorsed both public and private initiatives to boost partnership among the member states with a strong emphasis on the communicative and cultural implications this would entail. This has led to an explicit linguistic and cultural awareness in different realms of society in these member states. Notwithstanding the economic implications of the new partnerships among these countries, one of the main concerns which have been addressed is the vehicular language in these transactions.

Even though English has risen as the *lingua franca*, mostly influenced by the economic prosperity of many English-speaking countries, the different European institutions have tried to encourage the use of languages other than the mother tongue and English among



its citizens in order to endorse the varied multilingual and multicultural nature of the European Union. It is significant to highlight the intrinsic power of languages as tools of change within society and how these may influence their environment: a recent example of this could be the uncertain position of the English language in European institutions after Brexit. Therefore, language status is an issue taken into consideration when promoting languages (e.g. revitalisation of minority languages in Europe) which may play a role on how the public accepts different language-related proposals.

In the educational realm, CLIL programmes have become the norm in almost all European countries (Eurydice; 2006, 2012). The first pilot projects carried out in the 1990's were developed and improved towards a common goal: to encourage cooperation and educational innovation at school level by focusing on a dual approach to content and language. This has allowed for a different uptake on foreign language and the methodological implications diverting from the traditional approach to foreign language where language was the basis, the means and the end.

In the last decades of the 20<sup>th</sup> century, some methodologies on foreign language learning started challenging the one-directional language-based approach to language learning; thus, Content Based Instruction (CBI) and Content Based Language Teaching (CBLT) introduced content in the FL classroom. However, content was used as a means to an end: language learning. Contrary to this, CLIL stands out as a supportive methodology to both language and content as joined entities. It should be considered that this dual nature not only does represent a step towards language flexibility and content proficiency but also a step towards opening new ways of professional-based communication and specialisation around Europe.

Nevertheless, it is important to highlight the heterogeneity of the state members in social, economic and political terms and how these would influence educational policies. It is not farfetched to think that these elements along with the public's attitudes may lead to a 'sink or swim' outcome in these programmes. The Galician case is considered a complex reality in sociolinguistic terms: even though the linguistic situation is defined by equal bilingualism by the government (all official languages are given the same treatment) the reality is more complex. Due to sociohistorical issues, Galician and Spanish are considered differently with Spanish often perceived as the prestige language and Galician as the language used in the rural or by the lower classes. These stereotypes have been often challenged by the public and the linguistic plans promoted by the government with different results.

This sociolinguistic panorama has had an impact on the implementation of CLIL at school and high-school level with some issues worth mentioning:

- Some people (e.g. parents, teachers, students, etc.) feel that the use of a language other than the two official languages in the autonomous community could be detrimental to the already weakened state of Galician, and see the language of instruction used in CLIL (often English) as a danger to the revitalisation process of the Galician language.
- Others promote the implementation of the CLIL sections by stating the supposed importance of FL learning over Galician as they feel the foreign language to be more 'useful'.
- Regarding social differences, it has been pointed out that CLIL sections may be elitist: generally, students who become part of these groups are academically the best.

Furthermore, it should not be forgotten that these students attend private lessons more often than not, usually in urban environments.

Therefore, perceptions on bilingualism and considerations on different languages would impact the implementation and results of CLIL sections. Notwithstanding these issues, the bilingual nature of the Galician territory could be considered an ideal background to put into practice such a language-conscious programme as this due to the cognitive predisposition of native bilingual speakers towards learning other languages.

However, many different CLIL cases are present in the autonomous community with diverse outcomes due to the aforementioned heterogeneous panorama. Many variables come to play within these sections: environment, material and human resources and students' profiles are some of these. Therefore, a homogeneous uptake of CLIL in Galicia would result in an unrealistic or narrow picture of the implemented CLIL sections. In order to understand the CLIL reality, a hands-on approach would be advisable. This is to be accomplished by practical case studies of the CLIL classrooms.

Even though large scale quantitative studies provide a great deal of information on the CLIL panorama, it is necessary to go further so to understand the CLIL reality influenced by teachers and students alike. Thus, case studies offer an in-depth analysis of the classroom situation which may bring up practical issues related to individual and contextual factors. It cannot go unnoticed that the relatively small number of participants in these studies may turn out to be a major concern when trying to provide a homogeneous view of the CLIL reality and the possible extrapolation of results to other contexts. Nevertheless, small scale and longitudinal studies allow for a deeper analysis of the situation as well as adding to the growing pool of research.

Furthermore, in-classroom research allows for a refashioning of the research methods by accounting the educational reality: even though the type of research needs to be drawn previously to the case study, this may need to change in order to fit in with the classroom reality. Hence, in these cases, research should be adapted to these sections so to acquire significant data, much like a teacher who needs to adapt to their teaching group's profile. These adaptations to the preliminary objectives of the research should not be looked on negatively but as enriching opportunities to understand the real concerns in CLIL. This may open further research lines to serve the ultimate researcher goal: to improve the CLIL sections.

It is not improvable to affirm that students' profiles would have a huge impact on the implementation and keep of the CLIL sections. Besides the aforementioned contextual factors the group's profile would be the result of individual traits and social relationships within this set of students. Therefore, affective factors (especially during adolescence) play a crucial role not only in students' lives but also their learning process. These along with the theories on different types of students regarding their learning styles (VARK model; Fleming & Mills, 1992) and multiple intelligences (Gardner, 1983) have placed the student's profile in the centre of attention of teachers and researchers alike. Furthermore, the last decades have seen to a growing interest on affective factors in the classroom: anxiety, interest and boredom being some of them.

Some of these may be given by contextual factors such as the content subject, the teacher's style or the temporalisation of the subject among others. Nevertheless, students' self-perception of their CLIL experience and their overall impression of the CLIL section need to be accounted in order to understand the cognitive and affective implications of these projects from a practical perspective. Motivation in the EFL classroom has been studied from some decades so to gather information on how motivation would be a significant element in

regards to academic success (Clement, Dörnyei & Noels, 1994; Dörnyei, 1990, 1994; Lasagabaster, Doiz & Sierra, 2014; Henscheid, 2015).

Concerning motivation and perceptions in Spanish CLIL settings, studies have been carried out in the last years (Fernández Fontecha, 2014; Heras & Lasagabaster, 2015; Lasagabaster & Doiz, 2015, 2016; Pladevall-Ballester, 2015; San Isidro, 2017) most of them of a quantitative nature. Overall, the results showed positive attitudes and high motivation among CLIL students. Nevertheless, it should be pointed out that these studies were carried out in bilingual centres where CLIL sections are optional; therefore, the students' profile would differ from other type of CLIL students: plurilingual high-school students.

As plurilingual centres are becoming the reality in many cities around Galicia with new plurilingual centres each academic year, it is necessary to do research on this reality: are plurilingual CLIL students motivated like bilingual CLIL students have been shown to be? Do their perceptions on CLIL differ? Research on education needs to be understood as a practical approach to reality in order to serve to a purpose other than academic advancement, but to improve the classroom reality. Therefore, this doctoral dissertation endeavours to get close to the CLIL reality by means of a qualitative approach to CLIL practice by focusing on students' and teacher's motivation and perceptions to provide an in-depth analysis on how these issues come to play in this CLIL setting.

### **1.3.Thesis Structure**

This doctoral dissertation has been divided into eight chapters in order to facilitate its reading and give coherence to the text and the research aims. In regards to the inner structure of this study, the first chapters (Chapter 2, 3 & 4) are the theoretical framework necessary to understand the situation of CLIL and its precedents. These three chapters have been written following a progressive order in order to answer to Aim1: from an overview of CLIL as a

worldwide phenomenon and focusing on Europe (Chapter 2) to a more specific outline of CLIL in Spain and Galicia (context of the study; Chapter 3); finally, Chapter 4 delves into the main topics of the study (motivation). Chapter 5 deals with the methodological implications of the study focusing on how to analyse the collected data while Chapter 6 presents the gathered data and its analysis (Aim 2). This analysis is further elaborated by answering the research questions of the study in Chapter 7; also some guidelines to improve the CLIL section are presented in this chapter (Aim 3). Chapter 8 deals with the conclusions and other remarks such as further lines of research. A more in depth description of the chapters could be as follows:

- Chapter 2: this chapter explores CLIL as a worldwide phenomenon in order to account for the repercussions of this methodology focusing on European education. A diachronic approach is taken to understand the origins of CLIL going back to the times of the Akkadians and the most recent bilingual education projects in Canada and the US. This is contextualised within the European official plurilingual panorama and the initiatives undertaken to encourage plurilingualism and pluriliteracy. Furthermore, the aftermath of CLIL is considered using a dual perspective: academic literature and popular literature (e.g. newspapers) so to get a broader perspective on the issue, especially considering the significance of ‘non-academic’ entities such as students and teachers in this study. Then a definition of CLIL is provided focusing on its appreciation of it as an ‘umbrella term’ and Coyle’s four C’s. Moreover, some considerations about CLIL in Secondary Education –the educational level of this study– are provided.
- Chapter 3: the aim of this chapter is to explain the sociolinguistic and educational background of Spain and Galicia. In order to do so official documents such as the Spanish Constitution and the *Plurilingual Decree 79/2010* among others are

considered as the legal background to support bilingualism in Galicia. Nevertheless, some issues such as history, language perceptions and attitudes influence the linguistic reality, thus, it differs from the official version of an equal bilingualism present in the autonomous community. These concerns are addressed so to understand the linguistic panorama in terms of second and foreign language acquisition in secondary education. Taking a step further, the implementation of the bilingual sections in Galicia is considered by doing a literary review of the research done on this topic in the autonomous community. Furthermore, current challenges of plurilingual education are addressed in order to give an overview of the classroom reality.

- Chapter 4: this chapter presents the theoretical key elements to this study (motivation, cognition and CLIL). First, the main theoretical approaches to motivation are discussed with key concepts such as extrinsic and intrinsic motivation, integrative and instrumental motivation, amotivation, causal attributions and goals being looked on. Then some issues on L3 cognitive processing such as language awareness, attractor stages and cognitive development are considered to draw on students' metalinguistic awareness context also bearing in mind their status as bilinguals. Taking this as the starting point affective factors in CLIL such as anxiety, boredom and motivation are considered as elements which may alter students' perceptions of the CLIL classroom; thus, leading to cognitive distortions. In order to understand teachers' and students' perceptions of CLIL, the individual and social dimensions are studied. These are supported by literature on CLIL case studies dealing with perceptions.
- Chapter 5: the methodology used for this doctoral dissertation is presented in this study. The reasons behind the study group's choice and the chosen methodology are given so to contextualise the study in practical terms. A comprehensive overview of

the research methods —CAR (*Classroom Action Research*) and CA (*Conversational Analysis*)— is given with special emphasis on how these methodologies would be applied in SLA and CLIL. Then the research tools (questionnaires, interview, etc.) are described along with the data gathering process. Furthermore, the background context of the study (school, city, participants, etc.) is analysed.

- Chapter 6: the information provided by the research tools during the classroom observation is presented in this chapter as well as the discussion related to it. The data has been systematised by means of field notes and graphic elements which help to give an objective picture of the classroom reality in terms of students' motivation and perspectives. Furthermore, the data gathered from the teacher's interview as well as the systematic classroom observation is presented. These along the questionnaires on students' motivation serve to triangulate the data from the research study.
- Chapter 7: The aforementioned data is used in this chapter in an attempt to answer the research questions presented in Chapter 1. Furthermore, the obtained results are considered in order to propose some measures to improve motivation in the studied CLIL classroom; thus, fulfilling one of the aims of this study (Aim 3). It should be pointed out that these measures could be extrapolated to some extent to other CLIL sections.
- Chapter 8: the final chapter of the study deals with the conclusions reached after the whole research process has been completed. This allows for some reflections on the development and results of the study: were the results surprising? Was the methodology adequate? Furthermore, some thought on further research on the topic and new research lines are given to continue improving CLIL and motivation.



#### 1.4. Aims of the Study

This doctoral dissertation has been elaborated and built on the aims of the study as its setting stones. These aims have not only answered to mere academic research but they have been drawn accordingly with the educational reality that motivation and CLIL in Galicia represent. In order to fulfil this, three aims have been defined:

- Aim 1: to provide a theoretical background on key issues in CLIL and motivation.

RQ1: Do the linguistic policies in Galicia cater to CLIL?
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RQ2: Are the plurilinguistic policies applied in the studied CLIL sections?
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In the last decades the CLIL panorama has been studied through different perspectives taking into account the heterogeneity of the term and the different implementing strategies defined by the background context. The theoretical framework created by researchers has allowed for a somewhat homogeneous uptake on the topic at hand. Nevertheless, some disagreements have been presented, especially in regards to the outcomes of case studies, probably due to the different factors that come into play in CLIL classrooms.

Therefore, it is not farfetched to think that a concept which strongly relies on self-perception and is influenced by environmental causes such as motivation would be present in different ways in the CLIL sections. Different results could be found on CLIL and motivation; thus, a literary review of these two concepts is necessary in order to give an overview of the results found up to the moment. This allows for an in depth understanding of the concepts which would help to analyse the gathered data for this study.

- Aim 2: to study motivation in a Galician CLIL section.

RQ3: What perceptions towards the CLIL section do the students and the teacher have?
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RQ4: Are CLIL students and the teacher motivated? If so, what type of motivation do they possess?

RQ5: Are there significant differences in regards to motivation and CLIL-based perceptions among the three studied groups? If so, why?

Following the principle of studying the educational reality in order to improve it by means of research, one of the aims of this study focuses on analysing the classroom reality. Taking as a starting point a CLIL section in a Galician plurilingual high-school (2<sup>nd</sup> ESO Physics), a case study is carried out. Even though many variables and topics could have been studied within this research study, motivation was the main element chosen for this.

In the last decades motivation has been studied from the psychological and educational field with Gardner (1985) as one of the main precursors. It should be considered the great impact motivation has on students' perceptions, classroom environment and overall results; thus, motivation in CLIL sections could play a crucial role in these factors. In regards to motivation in Spanish CLIL sections, recent studies have been carried out in the Basque country and one long scale study on Galician CLIL has been presented (San Isidro, 2017). Therefore, there is much that needs to be done in regards to in-classroom research so to use motivation as a significant tool which may empower CLIL students and improve the overall results. In order to do so, action research in the classroom is necessary.

- Aim 3: to give a set of guidelines to improve motivation in CLIL.

RQ6: What elements should be revisited in order to improve the CLIL section in regards to motivation?

As it has been already stated, the purpose behind this study relies on the idea of academic research as a tool to improve society, in this case, CLIL education in

Galicia. Bearing in mind the varied nature of CLIL sections, it would be difficult to provide some concluding remarks which may be wholly applied to all these groups. However, classroom dynamics in CLIL have proved to share many traits in common so an extrapolation of the results could be made to some extent.

Due to the practical approach this study has taken, it has become necessary to reflect on proposing different measures to improve the observed CLIL classrooms by means of motivation. In order to do so, the group's profile as well as the obtained results would be considered to establish some measures which would lead to a more motivated CLIL group.

To conclude, the second aim of this study is linked to the research questions (RQ) based on the main topic of the study (CLIL perceptions and motivation). Nevertheless, it is important to highlight the relevance of the first aim (literary overview) in order to achieve the aforementioned objectives. Furthermore, the last aim of the study and its achievement provide some practical measures which can be possible thanks to the discussed literary review and the data analysis.



## **CHAPTER 2: CLIL AS A WORLDWIDE PHENOMENON**

This chapter is divided into four different subheadings in order to give a comprehensible view of the CLIL phenomenon in terms of historical evolution up until present times (2.1), a detailed definition of CLIL (2.2), its outcome from a sociocultural perspective (2.3) and its use in secondary education (2.4).

### **2.1. CLIL throughout history**

The concept of Content and Language Integrated Learning (CLIL) has been discussed in the last two decades. This may lead to presume that it is a new term and, while this is correct, the idea of “[e]ducation in a language which is not the first language of the learner is as old as education itself” (Coyle, Hood & Marsh 2010, p. 2), as content-based approaches have been present in the educational realm from an early period. Taking a look back, Mehisto, Frigols & Marsh (2008, p. 9) date the first CLIL practices to 5000 years ago in what is now known as Iraq: the Akkadians conquered the Sumerians but, despite their victory, the local language was not set aside in favour of the conqueror’s language as it has often happened (e.g. Old English in Britain after William the Conqueror), but Sumerian (the local language) remained and became the language of instruction to teach the Akkadians subjects such as theology, botany and zoology (Martínez, 2011, p. 94).

In classical times, a content and language approach to education was taken as the norm as the expansion of the Roman Empire led to the appropriation of Greek language and culture two thousand years ago; thus, making Greek the language of education among Roman children. Similarly, the Latin language became centuries later the language of instruction all around European universities (despite being a dead language by then) due to its status as the language of culture as well as the primary language used in fields such as law, theology and medicine.

Nevertheless, it is in the 20<sup>th</sup> century where the seed to CLIL was planted in the way of programmes such as immersion education and content-based instruction in North America (Dalton-Puffer, Nikula & Smit 2010, p. 1), specifically, “CLIL is considered to be a descendent of French immersion programs and North American bilingual teaching models” (Pérez-Cañado, 2012, p. 316). Among these the Canadian Immersion in the 1960s stands out as the grassroots’ bilingual programme; in the mid-1960s the Canadian government, aware of the deficiencies in some aspects of the French language in English-speaking enclaves, boosted the implementation of French in immersion programmes starting at kindergarten level. The origins of this programme can be traced back to a group of parents in St Lambert (Quebec) who, worried about the lack of skills their children had in regards to socialising and working with French speakers, proposed a programme:

in which, from the first day of school in the kindergarten, their unilingual-speaking children would be instructed entirely in French. Thus, the children first learned to read in French, and only later in grades two, three or four, were first language literacy skills introduced into the curriculum. Other subjects were also introduced in English in later grades so that by grade six about half the curriculum was taught in English and half in French. (Swain 1997, p. 261-262)

Therefore, French became the first language to be used in the educational realm with English-speaking children in Canada, thus, setting the grounds for an early-immersion programme. Similarly, Content-Based Teaching was introduced in the US around 1980s in order to answer to “the needs of specific group of students” (Stryker & Leaver, 1997, p. 5), in this case, students from immigrant communities. This rise of bilingual education in the late twentieth century answers to an introduction of bilingualism as a social, political and economic tool; not only in North America but all over the world.

In Europe, the origin of content-based education is traced to German-French grammar schools from the 1960s (Dalton-Puffer, 2007, p. 2). However, many scholars (Lorenzo & Moore, 2010; Dalton-Puffer et al., 2010) have pointed out differences between bilingual education and European CLIL programmes:

[O]ne of the key characteristics of linguistic development within bilingual learning relates to the fact that it implies vehicular use of language as a tool for the gathering and sharing of knowledge: Language as a means of study rather than the object of study. CLIL brings a new relevance to second language development – while traditional FL classrooms tend to treat learners as (deficient) *novices*, CLIL classrooms treat them as (efficient) *users*. (Lorenzo & Moore 2010, p. 24)

Consequently, the implementation of CLIL programmes brought a change in the methodological approaches to language learning concerning the place language occupies in the classroom; from a traditional perspective where language learning was the main goal to using language as a tool for studying. Hence, this turn in language learning and teaching “aims at achieving a functional as opposed to a (near) native-like competence” (Pérez-Cañado, 2012, p. 318). Even though CLIL programmes in Europe tend to lean towards the ‘C’ of the acronym (content) and language goals may be high but also implicit (Dalton-Puffer et al. 2010, p. 2), both language and content are to be dealt with in the CLIL classroom due to their dual-focus-approach nature.

It must be pointed out that “[s]chools in which the teaching of certain subjects in the curriculum may be offered in a foreign language have existed in Europe for several decades” (Navés 2009, p. 24). Nevertheless, the relatively new post-industrial and hyper-connected reality had led to an increase of European-funded and guided programmes to promote language learning and teaching. Marsh (2013) points out the rise of these projects to “the

influence of supra-national, national and regional directives, other forms of recommendations, actions and projects [...] through treaties, resolutions of the Education Council, parliamentary decisions and resolutions, and project actions” (p. 45-46).

In order to represent and encourage Europe’s plurilingual nature within the educational systems all over the continent, many actions have been taken at supranational level: in 1976 the Education Council wrote down the objectives for foreign language learning and teaching and stating that all students be able to learn at least one other European Community language (2013, p. 46). In response to this resolution, in 1978 the European Commission recommended that initiatives be taken on student mobility, early language learning, inclusion of the less able students and people in vocational education in language teaching provision. This commission highlighted the idea that the teaching in schools could be in more than one language, hence, promoting plurilingualism. It is in 1983 that a Parliament Resolution was passed in regards to language teaching in the European Union to implement an action plan so European-level exchanges could be possible for both teachers and students and a new plan on improving foreign language teaching and learning. Just a year later The Education Council (1984) deemed necessary to give fresh impetus to the way foreign languages were learnt and taught and to boost cooperation between the European countries by implementing the role of language assistants and encouraging students’ exchanges (2013, p. 47).

In the same spirit, the European Parliament (1984) passed a Resolution reaffirming the intrinsic value of all languages within the European Community; this along with the Education Council of the same year which demanded new means to foreign language learning led to the European Council Milan Summit of 1985 where it was declared that “citizens should have access to forms of language teaching which would provide a practical knowledge of other Community languages, and recommended that students should have the



opportunity to learn two foreign languages within the basic education curriculum” (2013, p. 46). In the following years language learning and its methodology became a central part of the Council of Europe expert forums held out between 1990-1996, and focused on bilingual education.

Less than a decade after the Milan Summit, the 1992 Maastricht Treaty became the first formal framework in reference to education, languages and training in the European Union, as well as the introductory document to two new concepts on language teaching and learning: “quality” and the “European dimension” (Marsh, 2013, p. 48). The Treaty “specifically argues that Community action should be aimed at developing the European dimension in education, particularly through the teaching and dissemination of the languages of the Member States” (2013, p. 48). This along with the promotion of innovative methods — here it is worthwhile mentioning the teaching of different disciplines in a foreign language— in the Council of Education Ministers Resolution of 1995 promoted bilingual teaching (Eurydice, 2006, p. 8). This is the first time in which the expression *Content and Language Integrated Learning* (CLIL) —a term coined by Marsh and Maljers in 1994, to be addressed later— is used.

The plurilingual awareness of Europe and the realisation on the positive effects of foreign language implementation in education and as a lifelong learning experience led to a boost of educational programmes which seek to reach foreign language objectives. Among these some stand out such as the achievement of proficiency level in three languages by the end of formal education (White Paper, 1995) and the active development of communication skills (Education Council, 1995). In the last decade of the 20<sup>th</sup> century and the ongoing 21<sup>st</sup> century it became clear that foreign language knowledge has become an indispensable tool to navigate throughout the European market, both in occupational (wider job opportunities) and personal terms.

However, some measures needed to be addressed in order to put into practice these educational programmes and some guidelines to be created: firstly, the *Common European Framework of Reference* (2001) was created to define the reference levels of language achievement. Secondly, it was acknowledged that:

[A]s a competitive economy is based on knowledge [...] education and training systems should become a world quality reference [...] this would require mastery of basic skills including digital literacy, and that this would be achieved by the teaching of at least two Community languages from a very early age and the establishment of a linguistic competence indicator. (Marsh, 2013, p. 51)

These factors set the ground for the birth of innovative pedagogical methods in action plans such as ‘Promoting Language Learning and Linguistic Diversity: An Action Plan 2004-2006’ (2003) where explicit references to CLIL are made in terms of promoting this approach to compulsory education. This is further specified one year later in the *European Profile for Language Teacher Education: A Frame of Reference* (Kelly et al., 2004) where it is noted that “CLIL approaches are recognised as a growing area in language teacher education across Europe and that many institutions already use them or are planning to introduce them” (2013, p. 53).

In 2006 the introduction of eight key competences (2006/962/EC; Council of Europe, 2006) for lifelong learning created a meeting point where cross-curricular or interdisciplinary issues were taught together, thus, promoting the similar approach that CLIL had taken towards the integrated learning of content and language. In the same year, the first report of CLIL practices —*Content and Language Integrated Learning (CLIL) at School in Europe* (Eurydice 2006)— was published concluding that:

The fact that a *substantial majority* of countries have introduced some form of CLIL provision does not mean that it is now offered to virtually all those who attend school. On the contrary, it is clear from analysis of the statistics available in the country descriptions that the CLIL approach *has not as yet been very widely adopted* and that, in some countries, developments in the field occur mainly in the big cities [...]. However, it is true that in many countries, measuring the impact of CLIL type provision is a little *premature*. Yet where evaluation has been conducted both on *pupil performance* and the *suitability of the methodologies* adopted, the results have proved very encouraging. This lends weight to the positive view that CLIL may be one possible means of furthering the declared EU aim of ensuring that most people in Europe should learn at least two foreign languages in addition to their mother tongue. In this respect, the education authorities in European countries are faced in the years ahead with the task of doing everything they can to *ensure that young people are more receptive to multilingualism* [my italics]. (2006, p. 56-57)

In order to reach these objectives, the last decade has seen to the expansion of CLIL in mandatory education and the successful introduction of this methodology in vocational education training (see Chapter 2.4) and with some drawbacks as the Eurydice report of 2012 pointed out (lack of qualified teachers, difficulties at implementing CLIL at official level, etc.). Nevertheless, some measures have and are still being implemented to fulfil these blind spots such as “the production of bilingual and multilingual textbooks for the teaching of non-language subjects” (Marsh, 2013, p. 60) and teacher training programmes (in Spain: PIALE, Programa Integral de Lenguas Extranjeras 2010-2020; PALE, Programa de Apoyo a La Enseñanza y el Aprendizaje de Lenguas Extranjeras). Those measures and countermeasures are the living product of centuries of trial-and-error methodologies, projects and educational

approaches which can be summarised in one common aim: “the improvement of quality and efficiency of language learning” (Eurydice, 2012, p. 3).

## **2.2 Defining CLIL**

As it has been previously stated, the CLIL phenomenon is not a new educational trend as teaching and learning take place in an additional language. According to Coyle et al. (2010) “CLIL is not a new form of language education. It is not a new form of subject education. It is an innovative fusion of both [...] CLIL set out to capture and articulate that not only was there a high degree of similarity in educational methodologies, but also an equally high degree of educational success” (pp. 1-3). Therefore, CLIL is not taken as pedagogical unique, but as historically unique in Europe (Cenoz, Genesee & Gorter, 2014, p. 244). Nevertheless, the term as it is understood today was coined by Marsh in 1994 and is nowadays understood as:

a dual-focused educational approach in which an additional language is used for the learning and teaching of content and language with the objective of promoting both content and language mastery to predefined levels. (Marsh, Mehisto, Wolff & Frigols Martín, 2011, p. 11)

It is worth mentioning the ‘duality’ of the term as it is where scholars and non-scholars alike find difficulties in classifying what CLIL is. On general terms it is understood that CLIL is content-driven but the additional language should not be forgotten as CLIL deals with these two. However, for many scholars the problem lies on the distribution of these two concepts in the classroom practice: some point out to an equilibrated 50/50% solution, thus, creating a more learner-centred class (Ting, 2010, p. 14) while others (Dalton-Puffer, 2007; Coyle et al., 2010) address the unlikely balance of content and language in the classroom. In regards to percentages on the use of content and language, Marsh (2002) has stated that these could vary

from one CLIL practice to another but “[i]f there is no dual-focus on language and non-language content within a lesson or course then it does not qualify as a form of CLIL/EMILE” (p. 17).

Nevertheless, this flexibility may leave room for questioning what CLIL would exactly represent in terms of pedagogical innovation. As Cenoz et al. (2014, p. 245) indicate this elasticity is not only found in the ‘dual-focused’ term but also on the ‘educational approach’: while some understand CLIL as instructional practices or a methodological approach to promote foreign language, others consider CLIL in curricular terms:

A conceptualization of CLIL with reference to curriculum is complicated further insofar as the link between language and content can take the form of a theme or a project and does not necessarily mean the use of an additional language as the medium of instruction for a whole school subject. (2014, p. 245)

This opens a new window for further examination of the concept of CLIL. The general understanding is that CLIL is composed of content and language teaching and learning, but this definition as it is may be considered too wide. In fact, other methodologies and educational approaches deal with language and content such as:

- Bilingual Integration of Languages and Disciplines (BILD)
- Content-based Instruction (CBI)
- Content-based Language Instruction (CBLI)
- Content-based Language Teaching (CBLT)
- English Across the Curriculum (EAC)
- English as an Academic Language (EAL)

- English as a Medium of Instruction (EMI)
- Foreign Languages as a Medium of Education (FLAME)
- Languages Across the Curriculum (LAC)

*(One Stop English ‘What is CLIL?’)*

Taking into account the variety of methodological approaches that may be included in the content-language dichotomy it may give the impression that CLIL is just the newest of a pedagogical trend related to foreign language learning and content. However, this aforementioned flexibility and adapting nature is part of the CLIL phenomenon as the definition of CLIL often brings around the idea of an ‘umbrella term’ (Mehisto et al., 2008); there is not a specific formula which would perfectly fit all (and diverse) CLIL sections. Therefore, the CLIL concept can be understood in different ways by different professionals but,

At the same time, such a broad concept of CLIL is ‘slippery’ because it ranges from the original broad view that includes different types of programs with use of an L2/foreign language as the medium of instruction (in and even outside of school) to a narrow vision of CLIL as representing specific pedagogical tools for teaching isolated content through the medium of English (English for Special Purposes (ESP), for example). Compared with traditional L2/foreign language teaching, the cornerstone of CLIL is content and this is often considered to be different and innovative. (Cenoz et al., 2014, pp. 246-247)

Even though it may seem that CLIL is similar to CBLT (Content Based Language Teaching), CLIL teaching refers to teaching a subject at the same time as teaching language whereas CBLT teaches content in language lessons (Dale & Tanner, 2012, p. 4). However, those

terms are often wrongly interchanged as in foreign language textbooks which have introduced into each unit a ‘CLIL activity’ whereas these activities belong to the methodology of CBLT. It may be argued that this ‘misplacement’ of the acronym CLIL answer to the rising popularity of the term or a lack of awareness on the differences between the two concepts.

Nevertheless, even though it seems to be a homogeneous term, CLIL projects share some principles all over the world despite the different initiatives. In regards to this, Pérez (n.d.) highlights three main principles that any CLIL project should follow: (1) the language is used to learn content of the subject but it is also necessary to learn the language in order to understand and communicate, this is, there is a double aim, content-wise and language-wise. (2) The language used is determined by the content so elements such as vocabulary, linguistic forms and skills will be dependent on the contents of the subject. The third principle Pérez points out is strongly linked to the communicative competence the CEFR promotes as (3) fluency is more important than grammar and linguistic precision in general.

This focus on communicative aspects in recent years has been latent in the new language learning methodologies. This has resulted into a dual focus on meaning and form, but the CLIL phenomenon has given greater value to fluency/communication over the most formal aspects of language learning. It has been innately attributed to CLIL the idea of being an encouraging background for a ‘natural’ and ‘real’ approach to language use (communication). This is related to the fact that language learning needs to be conceptualised within an authentic context; consequently, the CLIL classroom is said to fill this trait as it focuses on content/fluency rather than the more traditional foreign language classrooms where the interaction is considered by many artificial. In regards to this emphasis on “the importance of using language in authentic interactive settings in order to develop communicative skills, rather than focus exclusively on grammar” (Coyle et al., 2010, p. 33),

Coyle et al. (2010) take Savignon's (2004) principles for communicative language learning that are to be put into practice in CLIL classrooms:

- Language is a tool for communication.
- Diversity is recognised and accepted as part of language development.
- Learner competence is relative in terms of genre, style and correctness.
- Multiple varieties of language are recognised.
- Culture is instrumental.
- There is no single methodology for language learning and teaching, or set of prescribed techniques.
- The goal is language using as well as language learning.

(Coyle et al. 2010, p. 32-33)

This overview of language use and language learning seems to be the meeting point where communication is found to be the searched goal. The integration of these two concepts has been one of the biggest challenges (it will be addressed later on), but also the basis for CLIL. In fact, this integration has been taken as the pillars of CLIL which have been gathered in what is called Coyle's 4Cs (content, communication, cognition and culture).

According to Coyle, it is "a conceptual framework to enable teachers to plan their units of work and plan their lessons so that all the different elements of CLIL are connected (Centro del Profesorado de Granada, 2014). This framework is based on four building blocks (Coyle et al., 2010, p. 41):

- Communication: using the language to learn and learning to use it at the same time.



- Cognition (learning and thinking processes): developing cognitive strategies which link concept formations, knowledge and language.
- Culture (intercultural understanding and global citizenship): encouraging knowledge and integration of different perspectives besides tolerance in order to develop both individual and pluricultural consciences, as well as new European lifelong learning skills.
- Content (subject matter): allowing knowledge, skills and comprehension improvement of the specific topics of a determined curriculum; it is the axis of the CLIL experience and determines the learning process.

These concepts are to be understood not as isolated units but as interrelated and integrated pieces of the CLIL methodology. However, the context where these elements are to be placed must not be overlooked as these 4C's should be accounted as guidelines, but the context of situation will play an integral part on the effectiveness of the CLIL practice (see Figure 1, Appendix A: Chapter 2). Coyle et al. (2010) highlight that “effective CLIL takes place as a result of this symbiosis, through:

- progression in knowledge, skills and understanding of the content;
- engagement in associated cognitive processing;
- interaction in the communicative context;
- development of appropriate language knowledge and skills;
- the acquisition of a deepening intercultural awareness, which is in turn brought about by the positioning of self and ‘otherness’” (2010, p. 41)

This has led to the creation of some common principles to walk through the two-way road that “learning to use language appropriately whilst using language to learn effectively” (2010, p. 42) has become. These have been summarised (2010, p. 42) as follows:

1. Content matter goes beyond acquiring knowledge and skills; it deals with the learner’s own creation of knowledge and understanding as well as their own skills development (personalised learning).
2. Content is linked to learning and thinking (cognition). In order to allow the learner to create their own interpretation of content, this needs to be analysed so to find its linguistic demands.
3. Linguistic demands need to be taken into account also in the thinking processes (cognition).
4. The language learned must be related to the learning context (learning through the language, content reconstruction, cognitive processes, etc.). In order to be so, it needs to be transparent and accessible.
5. Interaction in the learning context is essential to learning.
6. Intercultural awareness is a key objective to CLIL.
7. Even though CLIL is spread throughout a wide educational context it must take into account all the contextual varieties so to be effective.

This requires a conceptualisation of each CLIL classroom in order to adapt to these principles, though there are some ‘universal’ facts that can be applied to every CLIL classroom such as the unlikeness that “the language level of the learners will be the same as their cognitive level” (2010, p. 43). Cognitive engagement is to be expected in a successful

CLIL environment as well as intellectual challenges; those could be achieved by problem solving activities or creative thinking (2010, p. 29) among others.

Coyle et al. (2010) emphasise the importance of cognitive skills:

Leaving these skills to develop by chance is not an option. Instead, we need to support students in developing life skills such as dealing with the unexpected, observational skills, and constructing knowledge which is built on their interaction with the world, yet purposefully guided by values and convictions. (p. 29)

This has to be further expanded to take into account the different types of thinking so to understand how the different thinking (cognitive) processes need to be studied in the CLIL classroom. In order to do so, Bloom's taxonomy (1956) has been taken as the reference point and it has been revised lately by Krathwohl (2002). This revised taxonomy is a classification system of different types of thinking divided into the Cognitive Process dimension (see Figure 2, Appendix A: Chapter 2) and the Knowledge dimension (see Figure 3, Appendix A: Chapter 2). The latter is divided into four different types of knowledge: factual, conceptual, procedural and metacognitive knowledge. Within the Cognitive Process dimension a division (Coyle et al., 2010, p. 30) is made between lower-order processing (remembering, understanding and applying) and higher-order processing (analysing, evaluating, creating).

This uptake on the different types of processes must be also accounted for in regards to the linguistic demands they would present on the learner. Therefore, an analysis of CLIL language should be addressed; in order to do so, an intensive analysis of the language of instruction and its functions must be conducted. Dalton-Puffer (2007, p. 128) points out that academic language functions may be best understood as a special case of the general communicative functions of language. These functions are classified as (1) being linked to certain interactive and social situations and (2) playing an important part related to language

functioning as a social tool. These communication practises give rise to linguistic conventions, hence, a “certain spectrum of realization becomes established, providing linguistic and structural patterns for coping with standard situations” (2007, p. 128). Then, having control over these conventions which are of utmost importance to the development of communicative competence this will be reached.

It is difficult to determine how many academic language functions can be as this area has not been exposed to many researches from a linguistic point of view (2007, p. 129). However, Dalton-Puffer (2007, p. 129) compiles a list of the most common academic language functions in English in the literature related to the topic. It must be pointed out that not all the language functions will be used in all CLIL classrooms but the content will probably define the need for specific language functions to some extent:

- Analysing
- Classifying
- Comparing
- Defining
- Describing
- Drawing conclusions
- Evaluating & assessing
- Explaining
- Hypothesizing
- Informing

- Narrating
- Persuading
- Predicting
- Requesting/giving information

It cannot go unnoticed that some of these language functions (e.g. analysing, evaluating, etc.) coincide with some of Krathwohl's cognitive thinking processes, thus, making the relationship between cognitive and language issues highly explicit. Furthermore, it must be pointed out that many of these functions of language are not only delegated to the academic context and they do not all work on the same level: some of them are linked to specific lexical and syntactic patterns whereas others are not.

Hence, two terms were created to define this diversity: micro-functions and macro-functions. Dalton-Puffer defines micro-functions as "language tasks with comparatively narrow purposes, which cover limited stretches of discourse (a couple of sentences) and are recognizable by distinctive sentence patterns and/or discourse markers" (2007, p. 130). Macro-functions, on the other hand, are defined as longer stretches of discourse and not related to any specific lexico-grammatical features.

There is a similar distinction in CLIL classroom language use with content-obligatory and content-compatible language. On the one hand, content-obligatory language has been defined as specific subject language recognised with key grammatical, discursive and lexical elements for each subject. On the other hand, content-compatible language is not marked by a subject and may be learned in the English class in order to communicate more fully. This differentiation in the types of language allows the CLIL teacher to become aware of the "interrelationship between content objectives and language objectives (Coyle et al., 2010, p.

36). This relationship is represented in the Language Triptych (see Figure 4, Appendix A: Chapter 2) where the CLIL vehicular language is analysed from three different perspectives:

- Language of learning (language of instruction): “an analysis of language needed for learners to access basic concepts and skills relating to the subject theme or topic [...] this means shifting linguistic progression from a dependency on grammatical levels of difficulty towards functional and notional levels of difficulty demanded by the content” (2010, p. 37).
- Language for learning: type of language needed to work in a foreign language environment, that is, “a repertoire of speech acts” (2010, p. 37) for an effective learning process (e.g. language for effective scaffolding).
- Language through learning: a deeper learning based on the learners articulating their understanding as “effective learning cannot take place without active involvement of language and thinking [...] it is to do with capturing language as it is needed by individual learners during the learning process” (2010, pp. 37-38).

This triptych seems to be contextualised within the language dimension of CLIL, but the other CLIL dimensions should not be forgotten. Marsh, Maljers & Hartiala (2001) define five different dimensions and state that “[i]nsight into the dimensions of CLIL practice allow us to identify the core principles of this educational approach as it is done in very different European contexts [...] The dimensions are idealized and should not be viewed as ‘standing alone’, because they are usually heavily inter-related in CLIL practice” (2001, p. 17). These dimensions and their respective aims are summarised in the following subheadings:

- Culture dimension:
  - Build intercultural knowledge and understanding

- Develop intercultural communication skills
- Learn about specific neighbouring countries/regions and/or minority groups
- Introduce the wider cultural context
- Environment dimension:
  - Prepare for internationalisation, specifically EU integration
  - Access international certification
  - Enhance school profile
- Language dimension:
  - Improve overall target language competence
  - Develop oral communication skills
  - Deepen awareness of both mother tongue and target language
  - Develop plurilingual interests and attitudes
  - Introduce a target language
- Content dimension:
  - Provide opportunities to study content through different perspectives
  - Access to subject-specific target language terminology
  - Prepare for future studies and/or working life
- Learning dimension:
  - Complement individual learning strategies

- Diversify methods and forms of classroom practice
- Increase learner motivation

These dimensions represent in wide terms the pillars in which European CLIL projects stand. Even though they have been presented separately it must be pointed out their real strength relies on their interrelation and the integration of all these dimensions in order to produce a successful CLIL programme. In this, the ‘umbrella’ nature of the acronym should be accounted; therefore, it is important to bear in mind that CLIL classrooms may differ from one place to another. However, this should not be taken as a failure in understanding the CLIL concept (or putting it into practice) but as proof of the ‘adaptability’ and ‘flexible’ nature that CLIL embodies.

### **2.3 The Aftermath of CLIL**

Having discussed the background of CLIL projects and their practise, it is necessary to reflect on its impact in Europe as a newly implemented double-focused (content and language) programme. In order to answer this, the Eurydice Network —established by the European Commission in 1980— compiled two reports based on CLIL: *Content and Language Integrated Learning (CLIL) at school in Europe* (Eurydice, 2006) and *Key data on teaching languages at school in Europe 2012* (Eurydice, 2012).

The Eurydice 2006 report brought to light the provision of CLIL usage by the academic year 2004/2005 where CLIL was part of mainstream school education or a combination of mainstream education and pilot projects in the majority of Europe (see Figure 5, Appendix A: Chapter 2), and six countries (Denmark, Iceland, Cyprus, Liechtenstein, Portugal and Greece) had no CLIL provision partly due to “historical factors or geographical remoteness” (Eurydice, 2006, p. 14). Nevertheless, the report points out that:



The fact that a CLIL-based approach to learning is part of mainstream school provision does not mean that it is widespread. [...] Elsewhere [than Luxembourg and Malta], it is apparently offered to only a minority of pupils and in just a few schools, mainly where it is part of organised provision in a target foreign language. (2006, p. 14)

The number of countries implementing the CLIL programmes in mainstream education rose steadily in the last years: those with pilot projects turned them into part of mainstream education at some schools (e.g. Lithuania) and some with no CLIL provisions such as Portugal introduced them with pilot projects (Eurydice, 2012; see Figure 6, Appendix A: Chapter 2). Nevertheless, the Eurydice 2012 report states that “[a]lthough it exists in nearly all countries at primary and general secondary levels, CLIL is not widespread across education systems” (2012, p. 39). Chronologically-wise, it is also highlighted that CLIL has been implemented earlier in countries with several official languages (e.g. Belgium) and countries with one or more regional minority languages such as is the case of Luxembourg (Eurydice, 2006, p. 14). Furthermore, some European countries have chosen the minority or regional language as the language used in CLIL programmes such as Welsh in the UK (see Figure 7, Appendix A: Chapter 2).

In regards to language choice in the CLIL classrooms Dalton-Puffer, Nikula and Smit point out that “[t]he long-term outcome of CLIL in Europe is thus unequivocally directed toward increasing the English language abilities throughout the continent” (2010, p. 286-287). Even though some CLIL studies have been made on other languages such as French, German and Spanish (Coyle, 2013; Mearns, 2012; Wiesemes, 2007), the majority of these programmes have chosen English as the language of instruction. In contrast to this predominance of English in the language department of the acronym, there has been no selection of a subject as the mainstream choice for CLIL sections in primary and secondary

education (see Figure 8 & 9, Appendix A: Chapter 2). Nevertheless, the Eurydice 2006 report concludes that creative, sports or environmental subjects are more prominently used in primary education whereas science (mathematics, biology, physics, etc.) and social science subjects (history, geography, etc.) are more common in secondary education.

Despite these generalisations it must come to attention the high diversity within the implementation of these programmes as well as consider the adapting and wide nature of the term CLIL. Thus, it should be expected that some problems would arise when attempting to describe or define the success of CLIL programmes as their success might differ from one another. In order to answer to ‘How Can We Describe Successful CLIL Programmes If They are so Different from One Another?’, Navés (2009, pp. 27-35) drew ten headings on the traits of successful CLIL programmes which go as follows:

- Respect and support for learners’ L1 and home culture: proficiency in the first language helps to become proficient in L2. In some cases, stopping first-language development has been found to be counterproductive for second language proficiency and cognitive academic development.
- Multilingual and bilingual teachers: they are able to answer students’ remarks done in the L1 and recognise intuitively their needs due to their shared ethnic identity.
- Integrated dual language optional programmes: they are optional (not imposed) and not pull-out programmes whose aim lies at making learners competent in two languages where the target language instruction is “contextualised and integrated” (2009, p. 29).
- Long-term stable teaching staff: the long-term nature of CLIL programmes demands the continuity of teachers who are able to carry out their job at CLIL classrooms as

“[i]t takes at least seven years for a second-language learners to function with an adequate level of English proficiency in academic contexts” (2009, p. 30).

- Parental involvement: “crucial to the success of bilingual programmes because parents are resources, both to their children and to school personnel” (2009, p. 31). Furthermore, they are part of the decision-making process and they even act as promoters of bilingual programmes (e.g. early Canadian French immersion programmes).
- Joint effort of all parties: parents, teachers and educational authorities should be involved in the implementation of bilingual programmes besides being well-informed, aware and committed to the design and development of these.
- Teacher’s profile and training: proficiency in the target language, knowledge of language acquisition principles and pedagogical skills adapted for teaching foreign languages to children, enthusiastic, committed and open to change (2009, p. 32) are some of the traits of a successful CLIL/bilingual teacher.
- High-expectations and assessment: multiple assessment measures create “a vision and set of goals that defined the achievement levels of all students” (2009: 33). Moreover, Navés points out the “importance of building high expectations for all learners regardless of their individual differences and language and cultural background in particular” (2009, p. 33).
- Materials: appropriate material needs to address both language (usually English) and content, though, unfortunately, this does not seem to be the case and many teachers create the materials themselves.

- CLIL methodology: being aware of the varied characteristics in regards to CLIL methodology that have being presented in the last years by scholars' findings, Navés (2009) summarises them as follows:
  1. Teachers show active teaching behaviours.
  2. Appropriate strategies are used when presenting new information.
  3. Students' progress is monitored and immediate feedback is provided.
  4. Students are allowed to respond in a wide variety of ways.
  5. Integration of academic content and language on a consistent basis.
  6. Students' home culture is used as a tool for the teacher.
  7. Diverse task-work: hands-on task, experiential learning task, etc.
  8. Collaborative, autonomous and self-directed learning.

Even though extensive theoretical discussion has been done on the subject of how to implement CLIL (Coyle et al., 2010; Lasagabaster & Ruiz de Zarobe 2010; Meyer 2010), evidence-based research has showed that some problems have arisen from putting the theory into practise. It has been speculated that many of these problems come from the lack of a strong national education policy and the fact that the “formulations of specific language goals have remained rather general” (Dalton-Puffer et al., 2010, p. 284). Coyle et al. (2010) point out the political interests of national governments within the implementation of CLIL programmes and the preferred language of instruction:

[F]or governments, the relationship between local, regional, national and international languages is highly complex with regard to priorities and societal needs and is closely tied to their social and cultural contexts. They may be significant differences even

within the same country in relation to curriculum design and implementation and the politics and laws which determine issues relating to language and language education (such as the medium of instruction or the languages to be learned). (p. 154)

The political decision-making process of implementing CLIL may answer to and be influenced by many factors; the formulation of its curricula is a responsibility undertaken by the corresponding national agencies, though elaborate conceptual guidelines as well as structured input would be highly beneficial so to fulfil the idea of integrating content and language (Dalton-Puffer et al., 2010, p. 285). But far from supporting this integration concept of content and language “[f]or many, CLIL programmes are only seen as an attempt to counter poor language learning results in some countries” (Pavón, 2013, p. 12).

CLIL double-aimed goals (content and language) seem to be a profitable teaching/learning strategy where it has “the advantage of delivering ‘two’ (foreign language and content) for the price of ‘one’ (teaching units)” (Dalton-Puffer et al., 2010, p. 284). However, many researchers (Snow, 1998; Dalton-Puffer, 2007) have pointed out that “[r]ather than being based on integrated content and language curricula, CLIL lessons [...] proceed on basis of the respective, already existing national curricula for the individual content subjects that ‘happen’ to be taught in the medium of the CLIL language” (Dalton-Puffer et al., 2010, p. 285).

Much like the classical tension between scientific and humanistic fields, CLIL teachers often feel the strain between their training as content-experts and the language aspects of the CLIL classroom, hence, feeling concerned on the consequences of using foreign language in the students’ content-learning process (Dalton-Puffer, 2007, p. 5). This often results into ‘two fears’: (1) “foreign language may slow down proceedings” and (2) “lower language proficiency may result in reduced cognitive complexity of the subject

matter” (2007, p. 5). Furthermore, Coyle et al. (2010) write on the integration of content and language in the curriculum based on collaborative planning:

Curriculum design needs to involve language teachers and subject specialists, or class teachers with dual roles, in an understanding of the different contributions they make to more holistic CLIL experiences. Currently, collaborative planning and cross-disciplinary delivery of the curriculum, especially in secondary schools, is often left to chance or is dependent on the ‘goodwill’ of head teachers or senior management teams. (p. 159)

This may lead to think that the teaching staff is the sole responsible to the functioning and implementation of CLIL sections and, while lack of communication and collaboration are some of the reasons behind the failed implementation of CLIL in some cases (Marsh, 2013, p. 18), the 2006 Eurydice report highlights many factors that may lead to failure when implementing CLIL at school level (see Figure 10, Appendix A: Chapter 2).

In general terms, CLIL implementation seems to have been challenged by four main constraints (Eurydice, 2006, p. 51): 1) restrictive legislation, 2) a shortage of appropriately qualified teachers, 3) lack of appropriate teaching materials and 4) high costs. Among these causes the most repeated throughout countries is the one concerning qualified teachers; however, it must be accounted for the novelty of CLIL teaching by the time this study was carried out (2004-2005) as well as the wide nature of CLIL (an ‘umbrella term’ which is difficult to describe in a practical way for many teachers) so to answer the shortage of well-prepared teachers. This along with the fact that “[t]eachers themselves complain that there are virtually no initial and in-service training programmes devoted to methods used specifically to teach a subject in other than the normal language of instruction” (2006, p. 52) partly answers to how human resources (in this case, teachers) are one of the obstacles during the

implementation of CLIL sections in Europe: even though having language teachers available to help content-expert teachers may be helpful, this is not the final answer as language teachers have not been instructed on the special CLIL-teaching skills (Eurydice, 2006).

The argument on content-expert teacher's lack of proficiency in the foreign language and/or the specific skills for a CLIL teacher seems to be the starting point of the detractors to the CLIL methodology which has been challenged again and again by scholars and non-scholars alike (among these last ones, parents being the loudest). It might be argued that CLIL methodology finds itself to be on a "period of friction" (Marsh, 2013, p. 130) as the natural result of unsettlement and even fear that new educational changes bring around the collective mind.

Some issues have been brought to light on this 'for and against' debate such as whether the implementation of these programmes are based on political movements to boast about the innovative measures taken to boost foreign language proficiency (with little result, according to Marías, 2015); the idea that subjects (specially the 'hard' subjects such as maths and physics) taught in a foreign language would make content learning more challenging (as well as making the lives of homework-helping parents more difficult; de la Nuez, 2015); CLIL materials are not that easily available or may not meet the students' needs as foreign language and content learners —this latter supported by the idea of a further possible expense on the parents' side due to a textbook change.

Moreover, some socioeconomic and sociocultural concerns have also arisen in the bilingual debate which supports the idea of bilingual sections as segregating entities within students. Dalton-Puffer et al. (2010) call attention to this fact:

[B]eing educated in a prestigious foreign language has been the prerogative of elite education at prestigious institutions for centuries. An essential difference of present-

day CLIL, therefore, is the fact that is rooted within mainstream education<sup>1</sup> [...] It cannot be denied though that a lingering flavour of elitism has most likely contributed to the enthusiastic acceptance of CLIL by parents (and some students), in particular as regards being instructed through English, whose status is high given its prominence as the factor international language of today. (p. 3)

It brings to attention several points from the current debate of CLIL implementation which will be further elaborated in the following lines: (1) foreign language learning is considered to be for elite education; (2) acceptance of CLIL stems from its elite-based origin; and (3) the status of English as the international language promotes the acceptance of CLIL sections.

Taking into account the historical origin of foreign language learning —mainly represented in the public’s eye in the Greek and Latin lessons from the medieval times until the 20<sup>th</sup> century with privileged students and modern language teaching (mostly at private schools)— it is not surprising that many parents feel foreign language learning as typical from elite classes (1). In addition, many consider that foreign language learning to be a ‘waste of time’; thus, accompanying this statement with ‘Because, when will my child need to use [insert language] if they do not want to go abroad/work on something where foreign language knowledge is not needed?’. To further add to this, many parents project their language learning experiences into their children current foreign language learning: considering that these experiences are most probably based on grammar drills and few/no communicative approach exercises, a bleak picture of their children supposed language learning is drawn.

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<sup>1</sup> Dalton-Puffer, Nikula & Smit state that CLIL is rooted within mainstream education, thus, dissenting to some point with the 2012 Eurydice report which specifies that CLIL is not completely widespread across education systems (see Eurydice, 2012, p. 39).



Nevertheless, this aforementioned ‘eliteness’ seems to be a double-edged sword: while some understand CLIL sections as an agent drawn to divide students depending on their academic achievements (‘Only students with the best marks get into the CLIL sections in bilingual schools’; even though admission criteria is seldom the rule in Europe, see Figure 11, Appendix A: Chapter 2), others relish on this division by stating it is catering for students’ diverse profiles. Aside from this dichotomy, parents have been found to be initially agreeable to the implementation of CLIL sections (2): “Don’t we all want what’s best for our children? Wouldn’t it be great if we all were bilingual, trilingual, quadrilingual and all without any apparent effort? [my translation]” wrote de la Nuez (2015) on the topic. This desire for a proficient use of more than one foreign language reflects on the European Union’s boost of foreign language learning (at least two languages; see White Paper 1995; Commission Staff Working Document Language Competences for Employability, Mobility and Growth, 2012).

CLIL classes are seen as “efficient and effective language learning settings” (Dalton-Puffer et al., 2010, p. 6). Adding to this the common belief that content learning is more challenging in a foreign language, belonging to a CLIL section is often seen as proof of academic success, especially concerning foreign language proficiency. The fact that the language of instruction is usually English (up to the point that some scholars such as Dalton-Puffer et al. (2010, p. 286) write about ‘CEIL: Content and English Integrated Learning’) only gives more proof to parents that CLIL classrooms are beneficial to their children as the target language is a lingua franca (3) indispensable for their offspring’s future.

Despite being loved, challenged and stigmatised as a failure in non-academic contexts such as opinion articles (Marías, 2015), it cannot be denied that the implementation of CLIL has brought a transformation of the education system and a reassessment of current policies. Marsh (2013) points at the teachers as the:

[M]ajor power within the CLIL development trajectory, and it has been partly driven by commitment to change education and a sense that the types of teaching and learning practices embodied in CLIL not only work, but work with the generations of young people now in our schools and colleges. (p. 130)

This makes room for a revision on the teacher's profile as well as the necessary conditions for educational innovation. A void of knowledge is often created when assigning tasks in the implementation of CLIL sections which is often accompanied by a grey area concerning official measures. In order to answer this, Moujaes quoted in Marsh (2013, p. 132) describes the Finnish model of decentralised authority and empowered autonomous teachers as the ideal background for innovation. Marsh goes further and finds four main traits in education-wise improved countries: (1) peer-led learning for teachers and principals based on collaborative practice, (2) decentralising of pedagogical rights to schools and teachers; (3) additional support mechanisms for teachers and (4) sponsored experimentation and innovation (2013, p. 133).

For many countries, this implies a thorough change in many educational laws and its implementation may result in a long arduous process, but it must not be forgotten that “[l]anguage changes involving the medium of instruction are often based on long-term gains and on future needs, such as increasing competitiveness and economic prosperity” (Coyle et al., 2010, p. 155). It should be also pointed out that these measures fall in line with the European Commission and their encouragement of training plurilingual individuals so to cultivate a “cosmopolitan identity” (2010, p. 153). This is also reflected by the ‘recent’ trend towards competence-based education (blend of knowledge and skills put into practise). In regards to CLIL, this trend can be clearly appreciated by Coyle's 4Cs (to be addressed later) as they promote not only knowledge but also skill. The fact that competences are often interdisciplinary (e.g. mathematical, scientific and technological competence) and that two

competences are based on communication (in a mother tongue and in a foreign language) bade well for a “integrated language approach where first and other languages are conceptualised together as *being* complementary” (2010, p. 157) and the integration of content and language in the curriculum.

At European level, a profitable and supporting panorama for the development of CLIL sections is drawn, but research shows there is much to be done. Although officially and theoretical speaking CLIL has been implemented in most of Europe, some issues such as teacher training, expenses, results, official measures and popular opinion need to be addressed to reach a solid and successful basis for CLIL programmes. Taking into consideration the novelty of these programmes and that innovative measures in the education field take some time to take root, it is too soon to make any categorical statement on the success of CLIL sections. As a rapidly-changing educational phenomenon many research has yet to be made on the path CLIL is drawing and the effects it will have on educational practices: on this, CLIL teachers will represent a crucial role “to engage in meaningful collaboration to share successes and challenges, and to play a role in future directions” (Coyle et. Al., 2010, p. 163).

#### **2.4. CLIL in Secondary Education**

In the last decades, CLIL has been implemented in all educational levels all around Europe. However, not all countries have implemented CLIL in all levels; for instance, “the Czech Republic, Estonia and Bulgaria generally offer it at secondary level. In Poland and Romania, CLIL in a regional and/or minority language is provided in both primary and secondary education whereas CLIL in a foreign language is available at secondary level only” (Eurydice 2006, p. 20). Owing to political, sociolinguistic or economic reasons; CLIL implementation in some educational levels may not be possible, though it seems to be more

common in primary education than in secondary level (see Figure 12, Appendix A: Chapter 2). Due to the purpose of this study (analysing motivating factors in the CLIL secondary education classroom), this subheading will focus on CLIL in secondary education so to give a general background on the topic.

Firstly, it is necessary to provide an overview on foreign language learning in secondary education to understand how CLIL would be integrated within the curricula. In regards to language teaching at European schools, the Eurydice report (2012) highlights some unifying traits related to language teaching at secondary level which are summarised in the following points:

- Increase of lower-secondary students who study two or more foreign languages: 60.8% of lower-secondary students in 2009/10 compared to 46.7% in 2004/5 (2012, p. 10).
- The number of lower-secondary students who learn two languages is increasing (2012, p. 66).
- English is the most taught language with 90% of pupils in lower-secondary and general upper-secondary education, and 74.9% pupils in upper-secondary prevocational and vocational education (2012, p. 11).
- Languages less widely used are more promoted at secondary level (2012, p. 47).
- Students in general secondary education are more likely to learn languages than vocational students (2012, p. 62).
- Due to the curriculum diversity in secondary education, students may have the opportunity to choose foreign languages as optional subjects (2012, p. 10). This can

be further applied to the different high-school subjects that may be offered with a CLIL methodology depending on the students' academic path.

The data above draws a panorama of the European foreign language teaching context which is marked by an emphasis on secondary students learning at least two foreign languages; thus, resonating with the European Commission document on *Language Competences for Employability, Mobility and Growth* (2012, p. 2). It is also worth mentioning the role of English as the most common foreign language learned in Europe which can also be extrapolated to CLIL sections (Dalton-Puffer et al., 2010, p. 286). Nevertheless, it must not be forgotten that other languages are to be mandatorily studied in secondary education; for instance, in Brussels, Dutch is the mandatory language in French-speaking schools at ISCED levels 1 and 2 (Eurydice, 2012, p. 47).

Despite the diverse nature of the educational programmes in Europe regarding foreign language learning, in the last decades they have generally focused on taking a communicative approach to language learning as part of the European Union guidelines which highlight the need to form 'European' individuals with communicative skills to promote communications among state members. This process would have a continuous nature nurtured by the encouraging policies around the educational systems on foreign language learning in which CLIL stands out as a tool to achieve communicative goals. In regards to secondary level, it should be accounted the learners' previous experience with the language and their likely CLIL experience in previous educational levels as contextual items which support the idea of a continuum.

This idea of CLIL as a follow-up method in high-school is also present in Mehisto's et al. (2008) definition of a CLIL secondary student:

With secondary school CLIL programmes, students usually self-select, that is to say, they make the decision to join the CLIL programme themselves. They are likely to have a strong basis in the CLIL language, but could not be considered fluent. These students have usually had good grades in second-language classes. Students who have participated in a CLIL project or a language camp, or who have travelled to an area where the CLIL language is spoken, will have a clearer sense of what to expect. (p. 46)

This description addresses several issues pertaining secondary education such as the fact that students may choose whether to participate in the CLIL programme. This may be because a) the CLIL subject is one of the common courses for the academic year (e.g. social sciences in 3<sup>rd</sup> year of ESO in Spain) and students are offered to be part of the CLIL classroom or the non CLIL group—this can be done at bilingual high-school centres as in plurilingual centres all same-year and subject courses would follow a CLIL methodology apart from the special needs group—; or b) the CLIL subject is an optional subject which could be specific for the student's academic branch (e.g. Technology for high-school students of the technological branch) or all students of the same academic year (e.g. Anthropology).

Other point that is considered in the definition is students' level on the language of instruction used in CLIL. Taking into account the fact that English is the most widespread language in foreign language primary and high-school subjects (Eurydice, 2012, p. 11) and that it is also the most common language of instruction in all-levels CLIL sections (Dalton-Puffer et al., 2010, p. 286), it is not surprising that the majority of high-school students have had contact with the language of instruction (English) of the CLIL programme. In regards to their language level, Mehisto et al. (2008, p. 46) have pointed out the likeness of CLIL students' having good marks at second-language classes (this second language being more often than not the language of instruction in CLIL); nevertheless, the admission criteria for

access to CLIL (see Figure 11, Appendix A: Chapter 2) shows how few countries have implemented language-related criteria as a requisite for CLIL admission.

Therefore, CLIL students may not have the best grades in the second-language subject as a prerequisite to take part in a CLIL section, even though best second-language learners would probably want to belong to the CLIL project. Furthermore, it should be also accounted for the possibility of students having to take the CLIL high-school course mandatorily depending on the high-school such as the Spanish plurilingual high-schools where students are placed on CLIL classes no matter their foreign language level. Bilingual high-schools are to make a selection of CLIL-to-be students using different selection criteria such as ‘first come, first served’, ‘lottery’ and testing (2008, pp. 217-218).

A significant issue in secondary education is evaluation, especially concerning upper-secondary education as the final evaluation would define students’ university prospects. It is worth noting that:

Besides the assessment that all pupils undergo in mainstream education, assessment of their attainment specifically in relation to CLIL occurs in almost half of the countries concerned, normally in secondary education. In general, this special form of assessment is carried out in the CLIL target language and focuses on the knowledge learners have of the subjects selected for the CLIL curriculum. (Eurydice, 2006, p. 29)

This assessment of CLIL subjects in the target language is common in most countries in secondary education, though there are some exceptions (see Figure 13, Appendix A: Chapter 2). Although the data supports the target language as the one being used in assessing secondary education students, it must not be forgotten that these results may differ when it comes to yearly or final assessment of the subjects, state testing such as PAU (Spain), etc. In

regards to final secondary exams, Baetens Beardsmore (2001) describes different strategies used in some European countries:

The Netherlands (as in England and Austria) started bilingual content-matter education in the nineties, concentrating on secondary schools. Designers have had to reflect on the implications for final examination strategies. The Dutch insist on all final secondary exams for content matter being taken in Dutch, to avoid potential language shift, thereby affecting the curricular distribution of languages. This illustrates one effect of implementing bilingual programmes with a different strategy from that used in Germany, where final exams may be optionally taken in the two languages involved. (2001, p. 10)

Therefore, final examination in regards to CLIL in secondary education has been dealt with in several ways: using the target language, the mother tongue or letting the students choose between these. These different scenarios (use of the TL and use of the MT) may be read in terms of what CLIL stands for as (1) an accomplishment on the CLIL practice in the case where the language of instruction (the first 'L' in CLIL) is present in the final assessment of the content; and as (2) an oversight of the language of instruction in favour of an 'only-content matter' approach in the final assessments of secondary education.

To conclude, CLIL in secondary education has to be understood within the specific context of each CLIL practice, even though some common traits cannot be denied such as language policies, early language of instruction learning and academic level (lower-secondary and upper-secondary education). Final assessment issues should be accounted for at this academic level as they may have a hand in the way of implementing the CLIL methodology (e.g. CLIL sections are less common in Spanish upper-secondary classes due to the high emphasis put on preparing students for their external examination tests). In many



cases, this leads to a reconstruction of CLIL proposals and their aims on the teachers' side to fit these within the secondary education curriculum.



## **CHAPTER 3: SPAIN AND GALICIA: BILINGUAL ENTITIES**

This chapter is divided into four different subheadings in order to give a comprehensible background of the linguistic situation of Spain and Galicia dealing with their sociolinguistic background (3.1), how second and foreign language are dealt with in mandatory education (3.2), the implementation of CLIL sections and research done in Galicia (3.3) and the current challenges faced in plurilingual education (3.4).

### **3.1. Sociolinguistic Background**

The Spanish territory extends from the Iberian Peninsula (along with Portugal), the Canary and Balearic Islands as well as the autonomous cities of Ceuta and Melilla. Within the European Union it is the country further southwest of the continent and has a population of more than 46 million people (INE, 2017). Spain's territorial organisation can be described as a system of 17 autonomous self-governing communities and two autonomous cities (Ceuta and Melilla) supported by the Spanish Constitution (Art 2, 1978, p. 29315). Aside from the geographical variety the Spanish territory represents, it is worth mentioning its linguistic plurality shown in the different co-official languages used in the 'historical' communities such as Basque (Basque Country), Catalan (Catalonia and Balearic Islands; Valencian in Valencian Community) and Galician (Galicia) (Turell, 2001, p. 1), as well as smaller minority languages such as Aranese (Occitan language spoken in Val d'Aran), and Asturian (Asturias).

This linguistic plurality is described in the Spanish Constitution (1978) as follows:

#### Article 3

1. Castilian is the official Spanish language of the State. All Spaniards have the duty of knowing it and the right to use it.

2. The other Spanish languages will be official in the respective autonomous communities according to their Statutes.

3. The richness of the different linguistic modalities of Spain is a cultural heritage which will be object of special respect and protection.

(1978, p. 29315) [my translation].

Understanding this article as the starting point of the key legislation towards a plurilingual Spanish society, it has to be pointed out that even though Spanish is the official language of the country, other languages are accepted in their respective autonomous communities where they will be implemented according to the parameters of each one of these communities. However, some scholars such as Hannum (2016) consider the third article of the Spanish constitution to be tolerance oriented to other autonomous languages rather than promotion oriented (2016, p. 74). This would mean that the first language policy after the dictatorship period was one of an accepting nature, but it lacked dynamisation at a state.

It should be also accounted the socio-political scene of the first decades of the 20<sup>th</sup> century and the dictatorship period in order to understand the current linguistic panorama; the three main co-official languages of the Spanish territory (Galician, Catalan and Euskera) had been endangered at some point in the last centuries due to political reasons (e.g. the so called Dark Ages for Galician and the War of Succession in Catalonia). However, the late 19<sup>th</sup> century and the early 20<sup>th</sup> century saw to a revival in these languages supported by literary works and the starting 'liberal' nature of society. The uniqueness of these regions (partly due to its languages) was celebrated and officially given heed in the statutes of autonomy: the Catalan Statute of Autonomy (1932) and the Basque Statute of Autonomy (1936). However, the Civil War broke before the Galician Statute of Autonomy was created and regional languages were not promoted (if not allowed) during the dictatorship regime as the aforementioned Statutes of Autonomy were abolished. During this time, the ultra-nationalistic

feeling of unity resulted in the promotion of Spanish as the official language of the state and relegating the regional languages to the home environment. This did not only lead to the diminishment of languages in terms of number of speakers, but to the undervaluation of some of them as they began to have erroneous social connotations which can still be perceived nowadays (e.g. Galician is only spoken by people with no studies).

This panorama was the linguistic context in which the Spanish constitution was made. Even though changes towards a plurilingual Spain were made by the implementation of the Statutes of Autonomy after the constitution (Catalonia, 1979, 2006; Basque Country, 1979; Galicia, 1981), the heterogeneous nature of the Spanish territory and the historical challenges in regards to plurilingualism have become dissenting points to promote regional languages which have to face “the monolingual speakers’ linguistic intolerance towards speakers of the main minority languages [...] and society’s linguistic intolerance towards speakers of regional dialects, not only of Spanish (Andalusian, etc.) but also of Catalan, of Basque and of Galician” (Turell, 2001, p. 2).

A reflection on the number of bilingual and monolingual speakers needs to be made in order to understand the linguistic panorama of Spain. According to the INE (National Institute of Statistics), the Spanish population in 2016 is around 46 million people. Taking into account that the number of people living in the official bilingual communities surpasses 19 million, the percentage of people who live in a multilingual community is around 41% of the total population (see Figure 14, Appendix B: Chapter 3). However, these data only conclude that a high number of people in Spain live in a community in which two languages are official, but this does not mean that its inhabitants are bilingual. As Lorenzo, Trujillo & Vez (2011), point out “[b]ilingual individuals [...] do not necessarily constitute bilingual societies, same as bilingual societies do not have to be integrated in its whole by bilingual people [my translation]” (p. 27).

In order to understand the linguistic diversity in Spain accounting for the differences between autonomous communities, it is necessary to consider the different types of bilingualism established by Lambert (Lorenzo, Trujillo & Vez, 2011, p. 18-9):

- Coordinated bilingualism: two parallel linguistic systems are used independently and according to the situation where a word has two signifiers and two signified.
- Compound bilingualism: the items of two linguistic systems work as interchangeable alternatives (one signified for two signifiers).
- Additive bilingualism: social background encourages second language acquisition (e.g. foreign language learning in educational systems).
- Substitute bilingualism: second language acquisition may endanger the mother tongue and may lead to a loss of identity (e.g. immigrants).
- Equal bilingualism: the relationship between both languages is of an equal nature.
- Dominant bilingualism: the relationship between languages is one of subordination; one is primordial to the other.

All these types of bilingualism can be present in society in different ways and numbers; for instance, additive bilingualism is spread throughout the Spanish territory by means of the introduction of at least a foreign language in mandatory education. Furthermore, considering the vast number of bilingual speakers in Spain it is not farfetched to think all these exist in the actual Spanish linguistic panorama. Regarding bilingualism, Spain can be considered a bilingual society where some territories are explicitly bilingual (Galicia, Catalonia, Basque Country) while others remain monolingual in their nature (2011, p. 28); thus, departing from state-based bilingualism (e.g. Canada) and countries with unilingual nationalities (e.g. Belgium).

Nevertheless, a point has to be made on the states of these co-official languages as factors such as politics, economy, society and history have taken part in the current status of Galician, Catalan and Basque. Hannum (2016) addresses some of these issues as follows:

Regions, enjoying expanded political power in recent decades, in many cases find it advantageous to exhibit a distinct identity, which works to proclaim their legitimacy in having more independence from the central state. Often, these regions will enact education laws promoting the use of their own regionally based language in order to bolster that sense of regional identity and independence [...] Policy application inconsistency is of particular concern in considering urban and rural locales. (2016, p. 7)

Taking into consideration these ideological issues present, it seems that political claims have been linked to bilingual matters; thus, resulting in the appropriation of the regional language as a tool of identity against the state's identity. In the last decades some autonomous communities such as Catalonia and Basque Country have led campaigns of independence to different extents; both have promoted their respective regional languages as signs of identity and have extensive institutional support. The prestige of Catalan in Catalonia has increased in the last couple of years along with its speakers' proficiency (Pradilla, 2001), as well as Euskera in Basque Country (Cenoz & Perales, 2001). The Galician case will be addressed now on a deeper level.

Contrary to the other two regional languages and its respective communities (both bordering France), Galicia is found on the north-westernmost part of the Iberian Peninsula separated by mountains on the east, Portugal on the south and the Atlantic ocean on the remaining sides. While folklore tales denied Romans reached Galicia due to a case of literal 'cold feet' (*caligae* do not go well with humid weather), the truth is Roman soldiers arrived

in 137 BC and finally settled in 19 BC (Hermida, 2001, p. 111) bringing with them the Latin language from which Galician and Portuguese come. Between the 9<sup>th</sup> and 11<sup>th</sup> centuries Latin split in the north-western part of the peninsula to form a linguistic variety that will become Galician. From this point onwards, Hermida (2001, p. 115-121) points out six different stages in the Galician sociolinguistic panorama:

1. The Medieval Period (9/11<sup>th</sup> -15<sup>th</sup> century): Galician was the spoken language as well as being used in literature and administration, though it slowly started to lose support. After the Civil War in which Galician nobles backed the losing side, the Catholic Kings changed Galician nobles for their Castilian supporters and the Galician language was banished from public affairs.
2. The Dark Ages (16<sup>th</sup> – 17th century): Galician was thrown out of written works in the literary, administrative and religious fields; thus, banishing from cultural spheres due to the Castilianisation process in Galicia at the time.
3. From the Enlightenment to the pre-Renaissance (1700-1840): though the Castilianisation process continued, this period was marked by the first protests regarding the state of language and “a call for a change of status” (2001, p. 117) in the hands of significant literary figures showing their love for Galicia such as Friar Martín Sarmiento.
4. The Renaissance Period (1840-1916): as its name indicates, this period was marked by a boost on the status of Galician by means of the creation of a political ideology in the hands of intellectuals whose aim was to defend Galician against the discrimination and marginalisation it has suffered. This was done by the establishment of the *Academia Galega* and the start of Galician literature. However, it should also be mentioned that Spanish, used by the higher social classes, was beginning to spread towards lower social classes.



5. The Nós Period (1916-1936): named as the Golden Age of Galician culture, the Nós Period draws its name from the Nós generation, a group of intellectuals whose main purpose was to reinstate Galician culturally, socially and politically. Aside from these movements, it also needs to be mentioned the continued decrease on the number of Galician speakers in favour of Spanish, the ‘prestige’ language.
6. The Second Renaissance (1936-present day): after the Spanish Civil War, the Castilianisation process was reintroduced again in many sectors and Galician was banished from public affairs once more. Galician was used “in such situations it was only to show up a poor and ignorant society, using the language to scorn and ridicule that society” (2001, p. 120). It is not until 1950 with the creation of the Galaxia publishing house that Galician literature and culture awakened to some extent, but it will not be until 1978 that Galician was recognised as an official language by the state and the so sought after *Lei de Normalización Lingüística* will not be passed until 1983.

The history of the Galician language is reflected in its current use and the public’s perception of it. In terms of language proficiency the results vary depending on the age group, class, education and location. In regards to Fernández Rei and Rodríguez’s study (1995), Hermida (2001) concludes that:

The highest figures registered for Galician as the first language (80.6%) [...] are to be found in the +65 age group, with the lowest figures being recorded for the 16-25 age group [...] the upper-middle class is the class with the lowest level of first language speakers [...] The lower classes are those which learn to speak Galician more than any other class [...] Galician as a first language and as the usual language drop progressively as we move from a rural area without public services, to a rural area with public services, to small towns, to the centres near

towns and finally to towns and cities. As far as the levels of formal education [...] the sector of the population which shows the highest figures for the usage of Galician exclusively or preferentially to Spanish is the sector with no formal studies (p. 122-123).

Therefore, the use of Galician in the autonomous community differs greatly depending on age and background with a profile of a lower class elderly person living in the rural with no formal studies as the ultimate Galician speaker and a high class youth living in the city with university studies as the ultimate Spanish speaker.

Furthermore, it needs to be considered the situations where Galician is used to understand the sociolinguistic context of Galician. Even though the use of Galician is encouraged by the public administration, Spanish is the preferred language to deal with in public situations such as with superiors and doctors (2001, p. 124) while Galician is preferred in informal or private settings. These data leads Hermida (2001) to conclude that Galician is used when the speaker thinks they can be their own selves and Spanish is used when the speaker wishes to be perceived as educated or knowledgeable (2001, p. 124). Hence, it can be affirmed that the Galician linguistic panorama is one of a diglossic nature if diglossia is understood as “a social phenomenon which implies a diversification of functions” (Lorenzo, Trujillo & Vez, 2011, p. 32). This is also closely linked to what is referred as social bilingualism (speaking one or other language depending on factors such as situation and context) and code-switching (act of using two or more languages in the same utterance). In many cases this perception of languages and its ‘given’ functions may be subconsciously done, though in a recent research carried out by the *Consello da Cultura Galega* (2017) on the linguistic practices of the Galician youth it is written that “on the whole, urban youth is also aware of this dichotomy as a stereotyped form of understanding Galicia’s sociolinguistic reality, in the way that it comes from beyond its

own subjectivity. Nevertheless, the emotional weight is seen even among the clearly active advocates of the language [my translation]” (2017, p. 36).

This same report also highlights the fact that much of the linguistic-based opinion of the Galician youth in regards to the language varies depending on the language ‘inherited’ (family background; 2017, p. 111). Regarding, the future of Galician by this group, the report concludes that, even though they recognise Galician is in a difficult situation and that efforts should be made to revitalise it, a low commitment to revitalise Galician is shown in the youths interviewed. Thus, a bleak prospect is drawn in regards to the future of Galician, especially compared to other regional languages which continue to strengthen in plurilingual young speakers in their respective communities.

### **3.2. Second and Foreign Languages in Mandatory Education**

The Spanish educational system can be described as a network of education-oriented royal decrees and laws contextualised by each autonomous community in order to address their particular backgrounds though sharing a homogeneous legal nature. This homogeneity is given by the Organic Law 8/2013 which serves as the main basis of the educational panorama in Spain. The preface of the law addresses the student as an individual being to whom education should help them achieve personal development and social integration (2013, p. 97858), but it also highlights that education is the “force that promotes a country’s wellbeing [my translation]” (p. 97858). In the same line, Mar-Molinero (2000) writes that “Education, then, both directs the population in an interpretation of national values, national symbols, and national space, and also effectively controls who can participate and have access to this national imagined community” (2000, p. 105).

This leads to understanding education as an identifying agent within the Spanish community where education is understood as having impact not only on individuals but also on their communities. As it has been addressed, the 1978 Constitution bears in mind the

homogeneous nature of the state and the linguistic diversity within Spain which is reflected in the *Lei de Normalización Lingüística* (1983) in the Galician case. This is relevant to answer the questions of how languages are used and which languages are taught (Mar-Molinero, 2000, p. 106).

The LOMCE (2013) highlights the case of the co-official languages stating that:

1. The education Administrations will guarantee the students' right to receive their learning in Spanish, the State's official language, and in the other co-official languages in their respective territories. Spanish is the vehicular language of teaching all over the State and the co-official languages are so in their respective Autonomous Communities according to their Statutes and regulations.
2. Finishing mandatory education, all students will be able to understand and express themselves (orally and in written form) in the Spanish language and, if applicable, the corresponding co-official language.
3. The education Administrations will adopt the necessary measures so the use of the Spanish or co-official language in teaching was not a source of discrimination in the course of the right to education.

[my translation] (2013, p. 97912).

Furthermore, co-official languages and their respective literature are to be given an analogous treatment to the Spanish Language and Literature Subject (2013, pp. 97871, 97873, 97875, 97877, 97878, 97882, 97884). This idea of equal footing between the Spanish language and the co-official language in education can be also seen in the careful wording all along the document of the two linguistic options. In fact, when dealing with how foreign language should be taught, it is specified that "the Spanish language or the co-official language will be

used only as support in the foreign language learning process [my translation]" (2013, pp. 97871, 97876, 97880) in Primary, Secondary and Upper-Secondary.

In regards to foreign language learning, the preface of the Organic Law (2013, p. 97865) states that the proficiency in a second or even third foreign language has become a priority as consequence of the globalisation process and, at the same time, showing this to be one of the weaknesses of the Spanish education system. Encouraged by the European Union towards plurilingualism, the law endeavours to strengthen the efforts to create plurilingual individuals able to get on fluently in at least one foreign language. On the same paragraph it is mentioned that the level of fluency on the four language skills (reading, listening, speaking and writing) would be an asset in regards to employability and professional activities as it is also mentioned in the *Commission Staff Working Document Language Competences for Employability, Mobility and Growth* (2012).

However, this positive disposition towards foreign language learning as a requisite for the current globalised world is influenced by the diachronic evolution of language learning and the aforementioned Spanish sociolinguistic background. The evolution of foreign language learning in the education system should be considered in order to understand the current linguistic panorama in Spanish schools. In order to do that, a contextualised summary of the different language policies throughout the 20<sup>th</sup> century needs to be given.

Regarding these policies, Tabuenca-Cuevas (2016) reflects on the historic isolation of Spain as a factor to bear in mind so to understand its place in the European Union and its current linguistic and even cultural standing: "Although the contribution of Spain to Western hegemony is undeniable, the fact that Spain is considered a failed empire (Linz, 1973; Rokkan, 1971) led to its marginalization within the second phase of hegemony early on" (2016, p. 439). Taking this into consideration, it may not be farfetched to think that the

marginalisation of Spain and the Spanish language in particular led to an effort from the Spanish language policy makers to be on par with other European countries in terms of foreign language learning. This along the political isolation Spain was in until the mid-1970s may be accounted in terms of how foreign language was dealt with in mandatory education in the first few decades.

It was in 1954 when the European Council member states state members signed the European Cultural Convention to promote foreign language learning in their respective countries. Even though foreign language had been introduced in the Spanish curriculum in the *Ley de Educación Primaria* (1945-1965), it is not until the *Ley General de Educación* (1970) that foreign language learning starts being introduced as understood nowadays and strongly focused on the audiolingual methodology and Skinner's behaviourism theories (Madrid, 2001, p. 12).

Nevertheless, some issues arose that exposed some deficiencies in foreign language teaching: teacher training was found to be lacking in terms of language knowledge and its teaching methodology (2001, p. 14) and "the lack of rational criteria in schools when assigning academic levels and subjects to teachers partly explains the mediocrity that English teaching in Spain has gone by in the last quarter of century [my translation]" (2001, p. 15). This led to a reconsideration of the work done up to that moment and the creation of a series of steps shown in the LOGSE (*Ley Orgánica de Ordenación General del Sistema Educativo*, 1990). Madrid (2001, p. 17) summarises them as follows:

- Students are supposed to communicate using the language in speaking and in writing developing a positive attitude and tolerance towards linguistic and cultural diversity.

- Didactic materials should also favour reflection on the mother tongue as well as making students aware about the nature and functions of language using diverse linguistic tasks.
- Acquire skills, strategies, values and procedures to facilitate future learning and reinforce previous knowledge.

In order to reach the ultimate goal (developing students' communicative competence in English), some methodological changes were put into practise in the 1990s (2001, p. 17):

- From the audiolingual method to the communicative approach.
- Europe as the new social context.
- A functional approach is adopted.
- Contextualisation is given great importance.
- Teaching is more student-focused.
- The construction of different 'learnings' and autonomous learning is facilitated.
- Students' communicative competence is developed.
- The curriculum is organised in conceptual, procedural and attitudinal contents.
- Students' interests and needs are to be satisfied.

[my translation] (Madrid, 2001, p. 17)

As the concept of language as a tool to use in the new European plurilingual panorama started to take root, the communicative approach and the communicative competence became the focal point of foreign language learning and teaching. In secondary education, this new perception of TEFL led to some new guidelines to follow in the teaching of foreign languages such as:

1. Students' communicative competence is to be amplified by the *cyclic acquisition* of new concepts, strategies, skills and attitudes.

2. The *pragmatic paradigm* is adopted.
3. In order to be more efficient and real, language is faced *contextualised* (e.g. dialogues, interaction-oriented texts, etc.).
4. *Multicomponential* conception of the syllabus based on Canale's takes on the communicative competence which is divided into 5 subcategories: linguistic, sociolinguistic, discursive, strategic and sociocultural subcompetences.
5. Be consistent with the *constructivism* contributions (e.g. working with different communication contexts so students will build new meanings).
6. A *cyclical* teaching introducing elements which form communicative situations in diverse contexts is recommended.
7. Taking as a starting point the fact that students were familiarised with a varied range of communicative situations in primary and the first cycle of secondary education, the second cycle of secondary education poses more tasks to improve this *communicative competence* in daily-life situations and to face new situations.
8. *Reflection* on the language so to encourage students' *autonomy* is to be incorporated.
9. The suggested tasks allow the development of the communicative skills to be done in an *integrated* way and consolidating productive skills.
10. Using *authentic* texts and 'realia'.
11. Learning is to be done *consciously* and *unconsciously* throughout different linguistic situations and contexts.

[my translation] (2001, pp. 20-22)

These changes are considered the starting point of the current foreign language teaching panorama in Spain as the starting point resides in the concept of communicative competence which had been introduced in Canale and Swain (1980) and later in the *Common European Framework of References for Languages* (CEFR, 2001). This way of understanding foreign



language led to an assessment of the didactic and methodological implications which had been the norm up until that moment: from a receptive understanding of the language following the grammar-translation methods towards a more productive-focused approach in which the language was firstly and foremost a tool to use.

Furthermore, it cannot go unnoticed how this desire of ‘communication’ is closely linked to the globalising market and more specifically the current European socioeconomic reality as foreign languages have become a commodity in the workforce and language skills concerning English are starting to be taken for granted. This has led to a considerable increment in the matriculation process for language certificates with Spain as the biggest market for CAE exams (Tabuenca-Cuevas, 2016, p. 438). Notwithstanding the fact that the collective’s mind understands that having a language certificate may not imply language proficiency, Tabuenca-Cuevas (2016) reflects on the fact 77% of Spanish adolescents (16-24 years old) prioritised speaking English than having an university degree in order to get a job (2016, p. 348).

Moving on to the 21<sup>st</sup> century, it should be mentioned the constant change education policies suffered in the last decades led to much social and educational unrest. From 2000 onwards several laws have come to be passed though not all of them have been put into practice:

- *Ley Orgánica de Calidad de la Educación* (LOCE, 2002): it was approved but never applied due to the opposition of the new government in 2004.
- *Ley Orgánica de Educación* (LOE, 2006): it abolishes the last two educational laws (LOGSE, 1990; LOCE, 2002). In regards to the first foreign language (mostly English; Muñoz, 2013, p. 67), there are four different blocks which are found in the different educational laws for all autonomous communities:

- Block 1: Listening, speaking and talking.
- Block 2: Reading and Writing.
- Block 3: Language Knowledge: linguistic knowledge and reflection on learning.
- Block 4: Sociocultural Aspects and Intercultural Awareness.
- *Ley Orgánica para la Mejora de la Calidad Educativa* (LOMCE, 2013): applied for the first time to some courses in the academic year 2014/2015, this law has been met with some controversies partly due to some changes in the curriculum. Regarding first foreign language, some significant changes were made in comparison to the previous law; the first cycle of ESO encompasses the first three years of ESO rather than the first two, each cycle (not each academic level) has its own contents and assessment criteria, and learning standards are introduced as the elements to be assessed.

Concerning contents, these are redrawn as follows:

- Block 1: Oral Comprehension
- Block 2: Oral Production
- Block 3: Written Comprehension
- Block 4: Written Production
- Block 5: Language Knowledge and Intercultural Awareness.

It is significant to ponder on the changes contents suffered from LOE to LOMCE regarding the different blocks in which contents are divided, but also the nature of these; the LOE uses these as the items to assess students while LOMCE contents are relegated to items students will be working with. However, the most significant change between contents from these different laws is their division: while LOE divides these into four different blocks, the LOMCE makes some further division in its five blocks.

However, some issues need to be mentioned regarding this division: (1) LOE presents different skills jointly in blocks (e.g. Block 2: Reading and Writing); while (2) LOMCE divides the skills in different blocks (Block 1-4) and adds what some scholars call the ‘fifth skill’ (Vernie & Barbuzza, 2008). Furthermore, (3) the traditional syntactic-discursive contents are to be found in a separate block in LOE (Block 3) but as an entry to Block 5 in LOMCE (Block 5.8). This skill-oriented approach in contrast to LOE’s more abstract taking on skills may answer to a new hands-on approach to language as a tool of communication in order to answer the socioeconomic demand for foreign language proficiency.

Following this line, many projects related to language proficiency have come to be introduced in the Spanish educational system so to encourage foreign language learning in the non-university studies such as the collaboration agreement between the Spanish Ministry of Culture and Education and the British Council. Introduced for the first time in some autonomous communities (mainly monolingual communities; Fernández Fontecha, 2009, p. 10) in 1996 and consolidated again in 2013, the programme seeks to “develop an integrated curricular project, to boost collaboration in the training of Spanish and British teachers as well as to develop research proposals [my translation]” (MECD & British Council, 2013, par. 10). In order to do so, teacher training is given special attention by means of educational programmes to improve their foreign language skills and also considering exchanges between teachers from both countries.

Teacher training adapted to the new plurilingual reality has become more common with the bilingual sections implemented in Spain with programmes such as PIALE and CALC in Galicia. These address teachers’ linguistic needs when facing the CLIL lesson focusing on the teacher’s linguistic proficiency rather than the language used in the classroom (see 3.4 for more). Nevertheless, the fact bilingual sections are spread throughout the territory could be interpreted as another step further towards a refashioning of the situation of foreign

languages in the education realm; thus, following the aforementioned European guidelines to boost plurilingualism at school level.

It should not be forgotten that foreign language learning in Spain using a communicative approach is quite a recent phenomenon that goes back a couple of decades: from a more receptive-skills approach in the mid-20<sup>th</sup> century in which reading and writing were the main goal to a more functional methodology with communication as the keyword, the education panorama in regards to foreign languages has made a significant change in Spanish schools and high-schools. Bilingual projects such as bilingual sections with the CLIL methodology have been introduced and have been met with both encouragement and scepticism alike. It may be argued that the often changing legal framework which characterises the Spanish educational panorama is one of the reasons for such scepticism around the bilingual sections along with the popular opinion on the collective's mind that Spanish education is weak at foreign language teaching. However, it must be considered that educational changes take time to take root and grow as short-term results are not to be taken as final results, only a long-term engagement and further advancement in which has been implemented will tell if bilingual sections will result in a positive outcome in the Spanish educational system.

### **3.3. CLIL Sections and Research in Galicia**

CLIL sections (also known as bilingual sections) have been part of the Galician school-life since 1999 as an experimental project in the academic year 1999-2000. They were firstly introduced in 3<sup>rd</sup> and 4<sup>th</sup> year of ESO and subsequently in upper-secondary and vocational training with a second phase in 2006 implementing it in primary school (San Isidro, 2009, p. 36). Since that, bilingual sections have grown in numbers with 4145 bilingual sections to be accounted in the academic year 2017-2018 and 322 plurilingual centres in the Galician territory (Villar, 2017).

The *Orde do 12 de maio de 2011* (2011) defines these bilingual sections in the following terms:

A bilingual section is the teaching organisation of a non-linguistic area or subject of primary, secondary, upper secondary or specific vocational training education to be taught on a level to a group of students in a bilingual way using a CLIL approach: in the corresponding co-official language following the current regulation and in a foreign language spoken in the EU which is imparted as area or subject to said students' group [my translation]. (2011, p. 10349)

It is worth mentioning that while this is the definition of the bilingual sections some other issues should be considered as they appear on the *Orde* (2011) and how this would apply to the specific Galician case. As it has been mentioned earlier (Chapter 3.1), the Galician linguistic panorama presents the cohabitation of two official languages (Galician and Spanish) with some sociolinguistic issues in their use; from an official perspective both languages are to be treated equally. Regarding the educational realm, language use is found in the *Decree 79/2010* for the plurilingualism in non-university education: it establishes an equal division of hours between Spanish and Galician (2010, p. 9243) and it also includes the possibility for the centres to offer up to a third of their timetable with subjects using the foreign language as the vehicular language (2010, pp. 9246-9247).

These measures are considered within the *Galician Plan for Foreign Language Boost* (2010-2011) whose aim is to promote plurilingualism in education. According to the General Subdirection of Education Management, Innovation and Teacher Training, more than 75% of public centres participate in this plan and almost 24% of public centres are plurilingual in the academic year 2016/2017 (2017). In this line the *Edulingüe 2020* project endeavours to fulfil the following language-based objectives by the year 2020:

- 100% of the mandatory centres will participate in bilingual sections or plurilingual centres.
- Plurilingual/bilingual teaching will be introduced in all non-university levels: early stages, primary education, secondary education, upper-secondary education (Baccalaureate of Excellence in Languages), vocational training, arts and sports teaching.
- Promote teachers with a C1 level in the foreign language.
- Students will finish mandatory education with a B1 level in their first foreign language and an A2 in their second foreign language.

(General Subdirection of Education Management, Innovation and Teacher Training, 2017).

Therefore, it can be easily argued that the legal framework behind education in this autonomous community is one which encourages foreign language at least theoretically speaking. Looking further into the *Orde* for bilingual sections (2011) some added clarification on how foreign language should be dealt with in and its presence at school the sections is made (2011, pp. 10349-10350):

1. Foreign language is to be used up to a minimum of 50 percent in the bilingual section.
2. Students who participate in the bilingual section will mandatorily take lessons in the foreign language used in that section.
3. Students might receive two weekly language reinforcement lessons taught by the foreign language teacher outside the official timetable (this is only applied to secondary, upper secondary and vocational training).

Although it has been pointed out the academic elitism of these sections at the beginning of CLIL implementation in Galicia (San Isidro, 2009) as a minimum mark was

asked to participants of the bilingual section, the current normative does not address students' marks as an issue to consider in regards to their presence in the bilingual section. However, it makes emphasis on the fact that any student enrolled in any of the courses where bilingual sections are offered can access to these with their parents' consent (*Orde*, 2011, p. 10350). Many scholars have pointed out the voluntary nature of these sections and the intrinsic motivation behind being able to choose to become part of them (González Gándara, 2015; San Isidro, 2010); notwithstanding the fact that these statements could apply to bilingual centres, it is not clear whether the same could be applied to plurilingual schools (see Chapter 3.4).

Other issues such as the number students per section need to be considered. Firstly, the Galician educational framework states the maximum of students for secondary education groups is 30 students, with 33 students for upper-secondary classes and a reduced 25 in primary education (*Orde 12 de marzo 2013*, p. 7894). These numbers have been source of public discussion for some time due to the so-calling 'massification' of the public school system. Compared to this, the bilingual sections stand out as an alternative to this high classroom ratio as the number of students per bilingual section is considerably lower: 12 students are needed to create a bilingual section, though the number lowers to 10 for upper-secondary and vocational training education, and only 8 students are needed to form a bilingual section in adult education (*Orde* 2011, p. 10350). However, contrary to the first CLIL classes in which there was a general minimum number of students to form a section (San Isidro, 2009, p. 37), bilingual sections with lower numbers could be implemented depending on the centre's traits and this being approved by the education inspection: this is only logical if we consider "the different types of centre in relation to their location and even more as Galicia is characterised by dispersed population in great part of its territory" (2009, p. 37).

Some other aspect which has seen greater development since the first experimental bilingual section up until now is the CLIL teacher and their role. First and foremost, the CLIL teacher has been considered as a subject or content-based teacher; this traditional take on their role has led to many questions around the idea on whether the ‘language’ in Content and Language Integrated Learning is being worked on. As mentioned above, foreign language proficiency has been moving towards a more communicative approach in language learning, so has teacher training as it is more common and common to find language proficiency requisites (e.g. language certificates) in order to access different teaching-related masters in Galicia (e.g. Master on High-School Teaching, Vocational Training and Language Schools). This leads to a reconceptualisation on the subject teacher’s profile and their role in the classroom and more specifically in the bilingual sections. In order to make sure the CLIL teacher is proficient in the target language and, therefore, able to use it in the classroom, one of the requisites found in the normative (*Orde*, 2011) is that every CLIL teacher should have a B2 certificate in the language of instruction, though it should be pointed out this measure is quite recent (2011).

Besides having a B2 certificate, the CLIL teacher needs to meet some other criteria such as having a fixed position in the centre and to participate in activities for initial and continuous training in CLIL teaching. In this line of lifelong learning and new resources, the Galician government offers specific resources regarding CLIL in their foreign languages webpage to be used in the classroom as well as providing a 50-hour certificate to the teachers participating in CLIL programmes (2011, p. 10353). Among some other functions, the CLIL teacher is responsible for:

1. Elaborating the specific syllabus at the beginning of each academic year.
2. Elaborating a final report.
3. Participating in the training sessions organised by the Consellería.



#### 4. Elaborating specific curricular materials

[my translation] (2011, p. 10353).

Even though the CLIL teacher is the main human motor of the bilingual section, they are not alone on their task as some linguistic backup may be needed in order to adapt the content-based lesson into a content-and-language one. Therefore, cooperation with a foreign language teacher is necessary as stated in the *Orde* (2011):

The department of the corresponding foreign language will commit to the coordination with the non-linguistic subject teacher of the bilingual section as well as the possible students' linguistic support with language reinforcement classes. In order to do so, each bilingual section will be coordinated by the teacher who teaches the foreign language to the group. Each bilingual section will have a coordinator [my translation]. (2011, p. 10351)

This leads not only to a refashioning of the non-linguistic subject teacher, but also a new uptake of the foreign language teacher profile as it is within their competences to offer support to the CLIL teacher. In fact, these new functions are considered in the *Orde* (2011) as follows:

1. To carry out a weekly follow-up and the coordination of the teachers part of the bilingual section as well as drawing up a record of the topics and decisions reached.
2. To coordinate the elaboration of the linguistic project and the integrated syllabus within the educational project of the centre.
3. To participate in the teacher training activities and to propose new activities.
4. To participate in the elaboration of specific materials, review and send the management team the initial syllabus and the final report.
5. If applicable, to tutor the programme's language assistant.

(2011, p. 10352).

These new teachers' profiles leave room to discuss some practical aspects in regards to their teaching practise and how the implementation of the bilingual sections would influence their work. It is clear that the introduction of new measures, methodologies and practices would bring some difficulties in their practical application such as materials, timetables and cooperation between the different teaching members of the section. Therefore, one of the main areas of interest would be team work between all participants in the implementation of CLIL; having considered that the CLIL the foreign language teacher (coordinator) have explicitly endeavoured to implement the bilingual section (a certificate of commitment from both teachers is one of the requirements), it could be said that the CLIL group force is highly motivated in the running of the bilingual sections and cooperation between its members.

In fact, research on the topic of CLIL and motivation has been carried out in other regions of Spain (Lasagabaster, 2011; Doiz, Lasagabaster & Sierra, 2014; Fernández Fontecha, 2014; Fernández Fontecha & Cangas Alonso, 2014; Lagasabaster & Doiz, 2015; Sylvén & Thompson, 2015). Furthermore, some longitudinal and quantitative research on CLIL in Galicia has been carried out by some scholars (San Isidro, 2010, 2017; González Gándara, 2015). This is to be considered in the following pages.

San Isidro's study (2010) sets off from his previous research on the topic (2009) in which he stated that "according to the opinion of teachers in 114 schools taking part in CLIL projects, an increase in students' motivation towards additional languages and an improvement in language competence take place via CLIL methodologies [...and that] content taught in the different subjects via CLIL is assimilated in a similar way as in a non-CLIL teaching context" (2010, p. 62). He then focus his study in providing evidence on CLIL

results in regards to competence in the foreign language; in order to do so he draws three hypothesis (2010, p. 64):

1. CLIL students would outperform non-CLIL students in a language skill test.
2. No significant differences in global and partial results would be found between female and male students.
3. No significant differences in global and partial results would be found between CLIL students from urban areas and CLIL students from rural areas.

In regards to the scope of the project, San Isidro (2010) bears in mind the different Galician contexts when dealing with different groups of students from the four Galician provinces in ten different schools who took part in the study voluntarily. The research was carried out in May 2009; therefore, it must be considered that the collected data comes from ‘experimental’ bilingual sections (before the *Orde* 2011). 287 CLIL and non-CLIL students (154 CLIL vs. 133 non-CLIL students) in the fourth year of secondary education took part in the research being the second year in a bilingual section for the CLIL students.

The designed instruments to assess students’ competence in the foreign language were skill-based approach tests bearing in mind the Common European Framework of Reference (2001) above the A2 level but below the B1. The tests were divided into: (1) Reading/Writing, (2) Listening, and (3) Speaking; these first two were done individually while the speaking part was done in pairs. Taking a look at the overall results of these tests, San Isidro found out that the mean score for CLIL students were 69.85 over 100 while non-CLIL students underperformed in contrast to their CLIL counterparts with a mean of 49.44 over 100 (2010, p. 69). Therefore, his first hypothesis was proved correct, though he also highlights the fact that students participate in CLIL programmes voluntarily (2010, p. 70) so their motivation in regards to foreign languages –hence, their level– could be a factor that needs to be considered.

Concerning gender differences among CLIL students in their level of proficiency in a foreign language, the study found out no significant difference between male and female means (70.55 and 69.28 respectively; 2010, p. 72). However, it is in his third hypothesis (no difference between students from rural and urban areas) that San Isidro was refuted as there are:

[S]ignificant context related differences as to oral skills between CLIL students in rural and urban areas. This could be due to differences regarding resources at the students' disposal [...and the fact that] students in urban contexts have more opportunities to have access to a myriad of different resources whereas those in rural areas are often lagging behind in access to educational technology. A contributing factor to this difference could be extracurricular exposure to English outside the school environment. (2010. pp. 74-75)

This study brought to light some issues in CLIL implementation in Galicia by taking into account the different geographical context and comparing CLIL and non-CLIL students under the premise that CLIL enhances foreign language proficiency (also considering the specific profile of these students in regards to motivation). However, due to the bilingual nature of the Galician territory and its linguistic panorama some perceive CLIL and the bilingual sections as a threat to Spanish and Galician learning in public schools stating that the coexistence of three different languages would be challenging to the students' learning experience. González Gándara (2015) addresses this issue in his longitudinal research of bilingual sections in 13 Galician schools by proposing the research question 'Does CLIL have a negative effect of on academic performance in the Galician or Spanish languages?' (2015, p. 15).

In order to answer this, he carried out a longitudinal two group study in which the experimental group consisted of 13 classrooms which had (at least) one subject taught through CLIL and a control group of 44 classrooms with no CLIL-focused subjects having a total of 747 students participating in the study. The gathered data is the evaluations from the students' schools, that is, their scores in Galician and Spanish. Using a quantitative approach, González Gándara proved there was not a significant difference between CLIL and non-CLIL students in their language scores for Galician and Spanish, though he did find a small variable in terms of the academic year he studied: the Galician mean was best in the academic year 2009/2010 and the Spanish score was slightly higher in 2010/2011 (2015, p. 18), though this is probably due to the different students' profiles and it has no relation with the CLIL methodology.

Overall, the study proved that no negative effects have been encountered in Galician and Spanish language proficiency. In fact, González Gándara (2015) points out that “in an initial stage, the mother tongue would be used more frequently and then the additional language would be introduced progressively” (2015, p. 21); therefore, it could be argued that the other languages would not be completely cast aside in the bilingual sections.

Concerning San Isidro's 2017 longitudinal study on a Galician rural high-school, the outcomes of the study contribute to “1) providing an in-depth knowledge of the effects of a language policy on a multilingual CLIL educational context, and 2) validating the participating stakeholders' results, voice and views” (2017, p. 3). Three groups were studied in this doctoral dissertation: students (20 CLIL students vs. 24 non-CLIL students), parents (N=44) and teachers (N=6). Regarding the areas of the study, these are divided into three focal areas:

1. Measuring by triangulation attitudes, motivation and perceptions in students, parents and teachers regarding the languages used (mother tongues and foreign language) as well as the CLIL implementation during two academic years (2017, p. 18).
2. Analysing students' exams results in Galician, Spanish, English (curricular subjects) and Social Sciences (CLIL subject) collected in three different moments in two years (2017, p. 19).
3. Analysing data related to classroom code-switching during students' interactions (2017, p. 19).

Regarding the first focal area, San Isidro points out:

[P]rogress in the development of more positive attitudes and motivations was different in both groups [of students]. The CLIL cohort's scores were significantly higher than the non-CLIL group's. Our results seemed to tally with the ones shown in previous research literature, although in our findings the non-CLIL students also showed and developed positive attitudes and motivation. (2017, p. 408)

This is further analysed in longitudinal terms; the motivation and attitudes in the CLIL are maintained and improved and even the non-CLIL group presented a positive change concerning these topics though to a lower extent than their CLIL counterparts (2017, pp. 408-409). In contrast to this 'homogeneous' overall positive uptake on attitudes and motivation, some significant differences are found between CLIL parents and non-CLIL parents: "The CLIL parents cohort's scores were significantly higher in every measurement and sustained in time, whereas the non-CLIL groups' answers showed lower scores and significant change only took place after year two" (2017, p. 410).

Teachers' views on these issues are also considered pointing out to students' language improvement (Galician, Spanish and English) from the teachers' perspective (2017, p. 412).

Furthermore, teachers' views on content learning in CLIL differ in quantitative data (CLIL affected positively content learning) and qualitative data (positive effects in content due to the CLIL methodology were less clear) (2017, p. 412).

In regards to the second focal area of the study, the results from the standardised tests present an improvement in both groups regarding foreign language proficiency though CLIL students outperformed their non-CLIL counterparts (2017, p. 415). This could be also extrapolated to the longitudinal data collected regarding students' competence in Spanish and Galician as CLIL students got better results than the other group (2017, p. 417). Furthermore, the results regarding content (Social Sciences exams) "seemed to confirm that CLIL did not make any impact on CLIL students' learning of content over the two years of implementation" (2017, p. 418).

Concerning the third focal area (analysing code-switching), the most common code change occurred from English to Galician (2017, p. 420) as 95% of students use Galician as an L1 (2017, P. 307). Regarding the types of categories in which students performed code-switching, San Isidro (2017) points out six categories: "equivalence, reiteration, monitor, side comments, alignment and intersentential code-switching" (2017, p. 420). Nevertheless, the number of switches in regards to equivalence, reiteration, side comments and intersentential code-switching was shown to decrease in CLIL students though there was an increase in the monitor and alignment categories (2017, p. 420). Meanwhile, non-CLIL students "reduced the number of switches to Galician by the end of the programme in three of the categories: equivalence, monitor and side comments [though] [n]o change was identified regarding alignment and a slight increase seemed to take place regarding reiteration and intersentential codeswitching" (2017, p. 421).

This study provides a thorough analysis of key issues to CLIL such as attitudes, motivation and code-switching which need to be further studied in the Galician autonomous community. This along the aforementioned studies open up the path towards a more comprehensive study of the CLIL sections in which classroom observation should be one of the key elements to be researched. Furthermore, some other practical aspects such as CLIL materials (Bobadilla Pérez & Galán Rodríguez, 2015) have not been fully developed up to the moment. In addition, the sociolinguistic and bilingual nature of the Galician territory makes up for a wide terrain where CLIL research may grow in order to reach conclusive results which may help the ultimate goal; to improve the work done in these CLIL classrooms. Overall, the figures provided by the administration in regards to the implementation of CLIL in Galicia are quite optimistic: a 93% degree of satisfaction for the CLIL sections in bilingual and plurilingual centres has been reported. Also the figures for linguistic skills (Galician, Spanish and FL) are reported to have doubled up in bilingual and plurilingual centres in contrast to centres which have not implemented CLIL (General Subdirection of Education Management, Innovation and Teacher Training, 2017).

### **3.4. Current Challenges in CLIL in Galicia**

As any new trend, the implementation of CLIL and bilingual sections led to two different responses: excitement and dread. Excitement because of the new and innovative methodology implemented to improve both content and language learning. Dread because of its newness and the intrinsic fear the unknown represents. Even though from the public's perspective it seems that CLIL has been around for quite a while now, it is very young considering the fact that educational projects take a while to take root. Within the CLIL phenomenon in Spain may have attributed the success or fail of this sections to the content teachers and their level of proficiency in the foreign language, but some other issues need to be addressed in order to understand the challenges in plurilingual education.



As it has been stated, Spanish educational laws have addressed the plurilingual nature of the Spanish territory in which languages cohabit following the corresponding legislation of each bilingual community. Even though the Spanish Constitution (1978) bears in mind the status of co-official languages, it is each bilingual autonomous community's job to deal with the legal framework in regards to the co-official languages. Therefore, this may lead to some issues related to the implementation of language policies in these communities which are to be addressed by the autonomous government. It is worth mentioning here that these measures may differ greatly from one bilingual community to another taking into consideration their different natures; hence, the sociolinguistic panorama of each region should be accounted for in the implementation of language policies.

The Galician case is characterised by a diglossic situation in terms of language usage in the autonomous community. Marco López (1993) pointed out that Galician has become the most well-preserved minority language in Europe but also the one with least prestige (1993, p. 181). Nevertheless, it is significant that Galicia is the bilingual community with the highest number of bilingual speakers (González Gándara, 2015, p. 20), though many of these speakers who speak Galician on a daily basis are elderly people and the number of youngsters who use both official languages is decreasing (*Consello da Cultura Galega*, 2017). The fact that Galician language is being 'lost' by new speakers threatens the survival of Galician has been met with official initiatives being introduced in public schools such as the *Equipos de Normalización Lingüística*.

Considering the precarious position of Galician despite the legal measures taken to secure its use and value, many feel its practical usage does not match the theoretical background the Galician government has drawn and see the implementation of CLIL sections as a threat to it. Educators, parents and teachers have opposed to bilingual sections stating that a third vehicular language would only make more difficult the teaching and learning

process. In order to implement these sections within the school environment, support is needed from different fronts –academic staff, teachers and parents–; therefore, a lack of commitment towards bilingual sections is an issue that needs to be overcome.

Furthermore, bilingual sections have to face not only the tradition in foreign language learning in Galicia, but the whole educational panorama as well. As it has been previously mentioned, foreign language learning has suffered great changes in regards to methodological principles having to do with the communicative competence promoted by European institutions. Among other reasons, CLIL sections have been introduced to address these issues by putting foreign language into practice outside the FL classroom. Therefore, the reconceptualization of the teaching and learning practise are to be addressed as a new change in the curriculum. From a practical perspective the development of the communicative competence would lead towards a change of focus in the classroom where skills development would win over content learning. This would lead to a refashioning of the educational system in terms of legal framework and classroom praxis.

The Spanish (and Galician) educational system has been traditionally one to prioritise content knowledge rather than critical thinking and creativity which have led many (González Nieto, 2013; Lendoiro, 2014) to criticise this model understanding that learning skills rather than contents would be more beneficial in the long term. Nevertheless, it must be considered that content-based teaching has been the norm around Spain for decades if not centuries. Therefore, a change of this magnitude (from contents to skills) would require commitment and participation from all sectors starting with the curriculum; even though it is true the new curriculum taken from LOMCE establishes more emphasis on skills and communication in order to be at par with Europe, some issues have caused controversy in regards of ‘real’ classroom practice.

For instance, assessment has become a hot topic as learning standards and not contents are to be assessed. This implies a refashioning of the curriculum taking into consideration these learning standards and how to evaluate students according to them. Furthermore, this seems to be a double-edged sword in bilingual sections: if CLIL represents ‘content and language’ learning in an integrated way, should not these two terms be assessed? If so, in what way? And how could this be possible if the same learning standards apply to CLIL and non-CLIL sections? This would lead to a refashioning of the curriculum from the educational government in order to answer to the reality of high-schools and the CLIL methodology. The idea of content first, then language resonates with what researchers (Dalton-Puffer et al. 2010; 2011) have found in other countries. Due to the lack of clear language-related goals in the aforementioned legal framework, teachers are faced with the challenging task of deciding on their own the language objectives which often leads to no language goals at all because of not knowing how to do so or fear of an unknown subject such as foreign language assessment

More recently, it has come to attention the problems that may arise with the famous ‘reválidas’ and the Selectividad exams at the end of upper-secondary education: many students who had been part of a CLIL section where the language of instruction was a foreign language are forced to take the exams in Spanish or Galician. This may lead to some further inconvenience to the students’ already nervous disposition towards the tests as the content-obligatory and content-specific terms which had been studied in English need to be translated into Spanish or Galician. Moreover, this could be seen by students, parents and teachers as further motive not to embark on bilingual sections as Selectividad exams have a strong impact on students’ university career.

So far research on Galician sections has been made on the premise that participation was voluntary and, therefore, students were predisposed positively towards the CLIL

classroom (San Isidro, 2010; González Gándara, 2015). Nevertheless, it should be accounted that there are two types of centres which offer CLIL teaching in Galicia: bilingual schools and plurilingual schools<sup>2</sup>.

- Bilingual schools: the most widespread throughout the community (4145 bilingual sections in the academic year 2017-2018; Villar, 2017). At least one subject in any academic level is offered following the CLIL methodology. Participation in these sections is not mandatory and a non-CLIL alternative is offered for those who do not wish to have a non-linguistic subject in a foreign language.
- Plurilingual schools: 322 schools are considered plurilingual in the academic year 2017-2018 (Villar, 2017). The number of plurilingual centres in Galicia has not stopped growing exponentially since the first year of its implementation in 2010/2011 to such extent that the number of these centres has doubled from 2012 to 2016 (Villar, 2016). This widespread of plurilingualism has its roots in the *Decree 79/2010* (2010) which establishes that a third of the non-linguistic subjects should be taught in a foreign language. Plurilingual centres address this legislation and implement the CLIL methodology in all their academic levels by means of at least one subject taught using a foreign language (usually English). In this case, students cannot choose between taking the subject in a foreign language or in their mother tongue; all groups from the same academic level are taught using the CLIL methodology (with the exception of the group formed by students with special educational needs).

This should be considered in terms of motivation and perceptions of the foreign language and CLIL subject in general. Although different studies have proved that CLIL students are more motivated than their non-CLIL counterparts (Doiz, Lasagabaster & Sierra, 2014; Sylvén &

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<sup>2</sup> Note here that when I refer to schools I am considering all centres from all levels of non-university education (early stages, primary education, secondary education, upper-secondary education and vocational training).

Thompson, 2015), these results should be taken in a broader context: firstly, motivation towards foreign language learning is surely higher in CLIL students as they have chosen to participate in the bilingual sections, so it is very unlikely they would have done so if they do not have a positive attitude towards it. Secondly, these studies were carried out in bilingual centres where students are able to choose; this is not the case in plurilingual schools.

Therefore, plurilingual centres may need to be considered differing from their bilingual counterparts as students' profile would be different. In plurilingual centres students do not choose to be taught a non-linguistic subject in the foreign language, though it is true this fact is probably known to them before enrolling. However, looking for an alternative in other non-plurilingual centre could be challenging taking into account the legislation for enrolling in public schools (living location is the first consideration). In these cases the fact that plurilingual education would become compulsory may lead to a negative uptake on CLIL as an element forced upon the student and even as something to dread.

In addition to this possible negative viewing of CLIL on students' side, the ratio of students should be considered. Bilingual sections may be perceived as an elitist option due to the academic profiles of those students who wish to take part in them (usually the best students in academic terms) and also due to that the fact that bilingual sections have a lower student-teacher rate (only 12 students are needed to create a bilingual section). Nevertheless, it is a stated fact that the Spanish educational system is characterised by a high number of students in the classroom and, although these sections may slightly differ from the norm, the number of students is still high in general. In regards to CLIL methodology and the communicative approach to foreign languages, a high number of students in the classroom would only hinder the development of the communicative competence as over packed classrooms in 50-minute lessons would not make feasible spoken communication from all

students, especially if we consider the different types of learners in regards to their cognitive learning style and their psychological differences (introverts and extroverts).

Having to cater for all types of students is within the legislation, but the practical side has been further discussed by teachers as something they read on papers but with no hands-on-approach response. Taking into account that the demographic of most teachers with a fixed position in Galician public schools follows the European line of an ever increasing old teaching force (OECD, 2014), it is not far-fetched to think that their learning on pedagogical issues during their formative years was limited (e.g. the outdated CAP). Therefore, it could be argued that new teacher training is necessary in order to face the diverse student force. This is highly significant when dealing with CLIL students and multiple intelligences (Anastasiadou & Iliopoulou, 2017).

In her study ‘Are teachers ready for CLIL? Evidence from a European study’, Pérez-Cañado (2016) states the training needs of pre- and in-service teachers, teacher trainers and coordinators in regards to bilingual education. She accounts the ‘relative novelty of the project’ and the tradition of the teacher as a ‘lone rider’ as some of the barriers to overcome in the implementation of CLIL (2016, p. 203). Taking into account that CLIL teachers “must not only master the foreign or second language, but must also have expertise in the subject content and training in second language pedagogy. This requires intensive staff training in pedagogical and theoretical aspects of language acquisition” (2016, p. 203). The study looks into five different blocks concerning CLIL implementation and teacher training:

- Block 1: Linguistic and Intercultural Competence
- Block 2: Theoretical Underpinnings of CLIL
- Block 3: Methodological Aspects
- Block 4: Materials and Resources

- Block 5: Ongoing Professional Development

The results of the study threw light on the perception of these blocks by teachers, trainers and coordinators: while the levels of linguistic and intercultural competence (Block 1) is seen as high, the theoretical understanding of CLIL (Block 2) needs to be worked on. Overall, “training needs are deemed considerable across all five thematic blocks to a lesser extent on linguistic and intercultural competence and to a much greater one on theoretical underpinnings and ongoing professional development” (2016, p. 214).

This may lead to conclude that teachers do not perceive the implementation of CLIL as further advancement on their professional careers, but what is more important for the classroom reality is that CLIL teachers cannot exactly pinpoint what CLIL means in theoretical terms; this could be interpreted as a deficiency in their training: in order to tackle this issue, Pérez-Cañado (2016) suggests incorporating CLIL training in pre-service teaching modules or Master’s (2016, p. 205).

In regards to the Galician case, some courses are offered such as the PIALE (*Orde 24 de abril de 2017*) and CALC (Cursos de Actualización Lingüística e Comunicativa) courses whose objective is to improve the linguistic and communicative competence in a foreign language by means of short immersion programmes or intensive courses within the autonomous community. However, no courses on how to introduce the foreign language into their content have been offered. Teachers meet voids or blind spots when it comes to the CLIL methodology: what are the stages of a CLIL lesson? Do we plan a CLIL unit differently to a non-CLIL one? Do we have to use all the time the target language? Where can I find resources or materials in the foreign language?

All these questions might be answered with the right CLIL formation that has not yet been given by the Galician government (no courses on CLIL and its theory have been offered

up to this moment), but they also reside in a new competence-based profile of the CLIL teacher. Melara Gutiérrez & González López (2016) try to draw the competence-based profile of a primary education teacher specialised in CLIL which can be adapted to secondary education teachers as well. In their research, six dimensions were presented for their documental study in a discussion group and an informing group:

1. Language
2. Methodology
3. Personal Skills
4. Catering for Diversity
5. Assessment
6. Teaching Quality

Within these aspects the bilingual-based methodology (1<sup>st</sup>) is the one to be considering most important when creating the teacher profile (the ‘integrated’ part of the CLIL acronym) followed by the teacher’s linguistic competence (2<sup>nd</sup>), assessment (3<sup>rd</sup>), personal skills and catering for diversity (4<sup>th</sup>) and tools for teaching quality coming last (2016, pp. 370-371). It is interesting to see that methodology is the most significant trait of a good CLIL teacher: from teaching strategies to selection of materials, it is the form (or skill) rather than the content which is considered important when implementing CLIL, thus, coming back again to the idea of skills (innovative education) over content (traditional education).

Concerning methodology, teaching materials is one of the first issues any teacher needs to address. Finding the perfect textbook or materials is challenging in any teaching situation: personal tastes, students’ background context, academic year and previous teaching experience are some of the aspects to consider when perusing a possible textbook. To this, the CLIL content teacher adds another challenge and that is to find a text in the target language appropriate for their students. In the last couple of years, many CLIL textbooks



have been produced; according to Doyle et al. (2010) some factors such as student and teacher roles; and affective factors such as motivation and anxiety will influence the success of these materials. Therefore, what works perfectly well for one CLIL group could not work that well for another one.

Even now in a never-ending technological society with all the available materials it is difficult to find that one textbook which could work and teachers resort to different resources: some teachers prefer CLIL textbooks done by teachers in their own country as they feel they understand the challenges and objectives of their CLIL classroom; other prefer textbooks from an Anglo-saxon country as they feel encouraged that they are using the same textbook native speakers are using miles away, but they all agree that adapting and creating materials is the best way to get the sought product.

In order to get the desired results, Coyle et al. (2010, p. 95) indicate the necessity of a continuum: 1) familiar language, 2) familiar content, 3) new language and 4) new content. Hence, the choice of materials and its following adaptation should be done in terms of content and language. This is not as easy as it may seem; even though it is true that every teacher has probably adapted material during their teaching experience, the CLIL teacher does not only face adapting the content but also the language. They can be helped on this bit by the CLIL coordinator but it must not be forgotten their meetings are reduced to one hour per week.

Nevertheless, this help is completed by the aid of a language assistant. Language assistants are native speakers provided by the autonomous government (at least in plurilingual centres). Usually, their hours are shared among all the academic levels during the foreign language sessions, but they may also help in CLIL sessions. The interviewed teacher for this work mentioned language assistants as something positive but with room for

improvement: although he agreed it was positive students had a native speaker to help them, he also pointed out that classroom management was a bit trickier with them and the language assistant in the classroom at the same time (language assistants cannot be left alone with the students) as students were easily distracted. Furthermore, he brought attention to the fact that language assistants had no previous didactic knowledge and no experience in a classroom as well as not being experts on the subject. Therefore, he felt their help was reduced to language translation tasks.

To conclude, as any educational implementation, CLIL has been met with challenges from all spheres of society. Even though government support in regards to funding has been increasing in the last years, many issues on classroom practice need to be brushed up. Broadly speaking, some areas which would benefit from a reviewing would be:

- Legal educational framework which should address more specifically CLIL sections in terms of learning standards, assessment criteria and Selectividad exams.
- More extensive teacher training should be looked for, aside from linguistic and communicative competence (more based on CLIL methodology and how to put it into practice in the classroom). Regarding CLIL training at university level in Galicia, only one course on CLIL methodology can be found in the master's degree of Specific Didactics at the moment in the University of A Coruña.
- Teaching materials should be given in depth thought in terms of both content and language.

In order to cater for the classroom reality of the bilingual section, the diverse nature of all CLIL sections should be considered and a specific reviewing on the needs of each section

would be ideal. However, a common educational background with practical issues such as the abovementioned would be indispensable so to provide the CLIL teacher with some guidelines which would help them into creating a solid CLIL experience in Galicia.



## **CHAPTER 4: MOTIVATION, COGNITION AND CLIL**

The following chapter explores the affective filters (particularly motivation) and how these are related to cognitive factors taking into account students' and teachers' perception of CLIL learning and teaching. In order to do so, this chapter is divided into four different subheadings: FL motivational theories (4.1), cognitive issues and language awareness (4.2), affective factors in CLIL (4.3) and CLIL perceptions (4.4).

### **4.1. Theoretical Approaches to Motivation**

L2 motivation research has been considered a quite recent phenomenon that goes back to the mid-20<sup>th</sup> century which looks at motivation in the foreign language from a linguistic and sociolinguistic point of view. This field of study was initiated by Canadian psychologists Gardner and Lambert (1972) with the former being the academic referent in the field until the late 20<sup>th</sup> century when other researchers such as Dörnyei and Ushioda reconceptualised his ideas. This led to a reconstruction and refashioning of the theoretical approaches to motivation in L2 in the last couple of decades with Gu (2009) defining four different approaches regarding L2 motivation-oriented theories: (1) social psychological approaches, (2) cognitive-psychological approaches, (3) situated and process-oriented approaches and (4) poststructuralist approaches.

#### *Social Psychological Approaches*

Within these approaches it is necessary to mention Gardner's motivation theory and his definition of motivation as:

[T]he combination of *effort plus desire* to achieve the goal of learning the language plus *favourable attitudes* towards learning the language [...] the extent to which the individual works or strives to learn the language because of a desire to do so and the

satisfaction experienced in this activity. Effort alone does not signify motivation. The motivated individual expends effort toward the goal, but the individual expending effort is not necessarily motivated [my italics] (Gardner, 1985, p. 10)

This definition establishes three different components to talk about motivation: effort, desire and favourable attitudes. These are not considered independent units but they need to be accounted for jointly in order to understand these as motivational factors.

Closely linked to these three concepts, Gardner draws two notions: integrative and instrumental orientations (Gu, 2009, p. 39). The first one is related to a desire to learn so to ‘integrate’ themselves with the target community or have contact with its members (e.g. learning your partner’s native language); while the second one (instrumental orientation) deals with a more pragmatic approach to learn a language due to a positive regard to L2 groups and their understood value of language proficiency (e.g. learning a language to improve career prospects). Regarding these two orientations, Gardner and Lambert (1972) concluded that integrative orientation would lead to better results than instrumental orientation due to the learner’s greater emotional involvement (Gu, 2009, p. 40). However, Gu (2009) points out that these perceptions of orientations were challenged in later studies:

- Four more orientations (knowledge, friendship, travel and sociocultural orientations) should be added to instrumental orientation (Kruidenier & Clement, 1986). Besides instrumental orientation had more weight in L2 learners who were not close in space and attitude to the target culture (Oxford, 1996).
- Integrative orientation was to be found in L2 learners who were able to interact with the target culture (Clement, Dörnyei & Noels, 1994; Dörnyei, 1990; Oxford, 1996).

This led to a refashioning of the concept of ‘integrativeness’ in Gardner’s socio-educational model by basing it three elements: (1) integrative orientation to learn the second language, (2) a positive attitude towards the L2 community and (3) open attitude towards other groups (Gu, 2009, p. 41). Nevertheless, this new model and conceptualisation of integrativeness was met with some discrepancies as this viewpoint only considered the individual’s attitudes and it obliterated the societal end in the individualistic-societal continuum as well as leaving aside some factors such as learning strategies, language anxiety, and instrumental factors (2009, p. 42). Therefore, it may be argued that a positive disposition toward the language and its community would not lead to integrativeness as the sociocultural context and the factors abovementioned need to be taken into account.

Following the idea of integrativeness and instrumentality, Csizer and Dörnyei (2005) created the self theory regarding L2 motivation with the concepts of ideal<sup>3</sup> and ought<sup>4</sup> self. In this dichotomy, integrativeness is within the learning process of the ideal self, while instrumentality is found in both selves depending on whether they are more externalised (ought self) or internalised (ideal self) (Gu, 2009, p. 44). This brought Csizer and Dörnyei (2005) to a redefinition of L2 motivation as “the desire to achieve one’s ideal language self by reducing the discrepancy between one’s actual and ideal selves” (2005, p. 30).

### *Cognitive-Psychological Approaches*

In regards to cognitive-psychological theories it must be accounted that they continue the social psychological approach of focusing “on the relationship between learners’ individual traits or internal factors within L2 motivation and the learning achievement” (Gu, 2009, p. 37) without considering the social spectrum of the L2 learner. In regards to L2

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<sup>3</sup> Ideal self refers to who one would like to become (Csizer & Dörnyei, 2005, p. 29).

<sup>4</sup> Ought self refers to who one think is their duty to become (Csizer & Dörnyei, 2005, p. 29).

motivation, three cognitive theories need to be accounted: self-determination theory, attribution theory and achievement goal theory.

The self-determination theory (SDT) was initially developed by Deci and Ryan (1985, 2002) based on three different types of motivation depending on “the extent to which a learner participates in an activity due to their inner drive” (Gu, 2009, p. 46). In order to study this, they divided motivation into three different types: intrinsic motivation, extrinsic motivation and amotivation (see Figure 15, Appendix C: Chapter 4).

- Intrinsic motivation (IM): “the inherent tendency to seek out novelty and challenges, to extend and exercise one’s capacities, to explore and to learn” (Deci & Ryan, 2000, p. 70). In the foreign language learning classroom this would be understood as the effort a learner makes due to the interest generated by the activities presented. Going a step further than the ‘intrinsic motivation’ label, some scholars (Vallerand, 1997; Vallerand, Pelletier, Blais, Briere, Senecal & Valliiries, 1992) subdivide it into three different subcategories:
  - IM-Knowledge: “the fact of performing an activity for the pleasure and the satisfaction that one experiences while learning, exploring, or trying to understand something new” (Vallerand et al., 1992, p. 1005).
  - IM-Accomplishment: “the fact of engaging in an activity for the pleasure and the satisfaction experienced when one attempts to accomplish or create something” (1992, p. 1005).
  - IM-Stimulation: “someone engages in an activity in order to experience stimulating sensations” (1992, p. 1006).
- Self-Regulation or Extrinsic motivation (EM): “the performance of an activity in order to attain some separable outcome” (Deci & Ryan, 2000, p. 71). The inherent satisfaction found in intrinsic motivation is not considered in this type of motivation



as a more tangible outcome is expected (e.g. getting a language certificate). This extrinsic orientation to motivation can be divided into different types depending on the level of self-determination:

- External regulation: the least self-determined form as “behaviour is regulated through external means such as rewards or constraints” (Vallerand et al., 1992, p. 1006).
- Introjected regulation: it is more internalised as “the individual begins to internalize the reasons for his or her actions. However, this form of internalization, while internal to the person, is not truly self-determined since it is limited to the internalization of past external contingencies” (1992, p. 1006). Thus, it is considered “somewhat external” (Deci & Ryan, 2000, p. 72).
- Identified regulation: “somewhat internal [...] conscious valuing of a behavioural goal or regulation, such that the action is accepted or owned as personally important” (2000, p. 72).
- Integrated regulation: the most autonomous type in which “identified regulations are fully assimilated to the self, which means they have been evaluated and brought into congruence with one's other values and needs” (2000, p. 73).
- Amotivation: the least self-determined type of motivation, it refers to “situations in which people have no reason for their performance [...] there is no relationship between their actions and the consequence of those actions” (Gu, 2009, p. 47). Lack of any type of motivation.

If L2 motivation is considered to be an ad continuum element, some issues regarding types of motivation from social psychological and cognitive psychological approaches should be mentioned. Gu (2009) points out that these types are related after having a look at different

studies (Noels, Pelletier, Clement & Vallerand, 2000; Noels, Clements & Pelletier, 1999, 2001) to which she concludes that instrumental orientation is closely connected to extrinsic motivation – external regulation specifically– and that integrative orientation is related to intrinsic motivation (2009, pp.48-49).

Also the attribution theory needs to be mentioned in regards to L2 motivation and cognitive psychology. Based on the concept of causal attributions and Heider's (1958) attribution theory on how people perceive causality, the basis of this theory endeavours to understand the causes which may play a factor in learners' motivational attitudes towards L2 learning. In order to do so, a diachronic perspective on the learners' past and present is studied so to investigate why some learners are highly motivated while others are not (Gu, 2009, p. 49). Three different dimensions are drawn within attribution theory in order to understand causal attributions: locus of causality, stability and controllability (Weiner, 1986, p. 551).

1. Locus of causality: the learner may locate the cause as internal or external.
2. Stability: a cause can be stable or changeable over time.
3. Controllability: to what extent a learner has control over an event or outcome.

However, this theory has been found to be deficient by not taking into account “the impacts of the learners' perceived future on their present motivated learning behaviors” (Gu, 2009, p. 50) as well as cultural differences concerning success and failure in non-Western countries.

Closely linked to this idea on learners' perception of their own achievement, the achievement goal theory brings focus to the motives-as-goals tradition. As a basis point this theory states that “depending on their subjective purposes, achievement goals differentially influence school achievement via variations in the quality of cognitive self-regulation

processes” (Covington, 2000, p. 174). Therefore, achieving goals would have a direct influence in the quality and the cognitive strategies used in the learning process.

It has to be considered the nature of the different type of goals as a key point in the consecution of these. Taking into account the school as background context two different types of goals should be accounted for: academic and prosocial goals.

- Academic goals: these can be divided into learning goals (improving competency, understanding and interest for the learning subject) and performance goals (outperforming peers to improve status). Concerning these types of goals, Covington (2000, p. 175) states that learning goals favour an in-depth processing of information, thus, resulting in school achievement understanding failure as part of the learning process and not as proof of incompetency. In contrast to this, performance goals offer a superficial processing of the information that would lead to an ineffectual influence on achievement with performance-oriented students using more sophisticated learning strategies but controlled by a fear of failure. Having considering this as well as extensive studies on the topic, Covington (2000) works with a sequence of *goals* → *cognitions* → *achievement*, thus, arguing that a deep-level processing on the cognitive spectrum would lead to an optimal background to goal achievement.
- Prosocial goals: based on the need for approval as a motivating factor, they evolve around the idea of social concerns and behaviours in schools (e.g. cooperation, rule abiding, helping others, etc.). Elements such as the need to achieve a sense of belonging to the group and the desire of individuals to perform well for the groups’ sake (2000, p. 178) are considered even though, compared to academic goals, the literature behind the topic of classroom achievement through prosocial goals has not been extensively developed.

Nevertheless, these goals should not be accounted for separately as “[n]ot only do prosocial goals likely influence achievement in their own right [...] they also likely act jointly with academic goals to influence achievement” (2000, p. 179). As a whole, some considerations that may need some further enlightenment in achievement goal theory would be the learners’ cultural and social background in terms of how and whether academic and prosocial goals could be found in different sociocultural contexts.

### *Situated and Process-oriented Approaches*

In the early 1990s, Gardner’s motivational theory started being redefined focusing on the educational field with Dörnyei’s (1994) model of motivation with a multilevel perspective to L2 motivation. Three dimensions (language level, learner level, learning situation level) are considered related to three dimensions of language: social, personal and educational dimensions.

- Language level (social dimension): it follows Gardner’s two subsystems (integrative and instrumental) as it considers the individual’s emotional tendencies towards the L2 (instrumental) and their extrinsic motivation (integrated) (Gu, 2009, p. 53).
- Learner level (personal dimension): language use anxiety, perceived L2 competence and causal attributions are some issues considered (2009, p. 52).
- Learning situation level (educational dimension): these are divided into three different types of components:
  - Course-specific motivational components (e.g. interest, relevance, satisfaction).
  - Teacher-specific motivational components (e.g. authority type, teaching style, direct socialisation of motivation).

- Group-specific motivational components (e.g. group cohesion, classroom dynamics).

Nevertheless, some weaknesses were found in these dimensions and components as (1) there is no clear relationship between the components; (2) the diverse nature of the components do not allow empirical investigation; (3) the goal component is not considered; and (4) the processes concerning the L2 motivation social dimension cannot be accounted for due to their complexity (2009, p. 53). In order to bring a process oriented approach to L2 motivation, Dörnyei and Otta (1998) developed a process motivation model so to “generate a comprehensive framework that incorporates the multiple lines of research” (Gu, 2009, p. 54). They divided then three main phases of the motivated behavioural process (pre-actional, actional and post-actional stage); thus, moving closer to the process oriented tradition of second language acquisition and practical implications for language learners and teachers (2009, p. 54).

In this line of SLA, empirical studies of task motivation have been carried out in order to move L2 motivation research towards “the more situation-specific and process-oriented. Moreover, task motivation permits an investigation into learners’ motivation and their specific language behaviors” (2009, p. 55). Findings on this type of task-motivation reported that, due to its dynamic nature, motivation is built on continuous interaction between external and internal factors as well as by situation-specific and more general motives (2009, p. 55).

#### *Poststructuralist Approaches*

Having considered the most long-term theories presented in the field of L2 motivation, Gu (2009) points out some concepts poststructuralist theories have introduced in the field: identity, agency and structure, investment, social self and communities of practice.

In poststructuralist theories regarding SLA, “identity and language are mutually constitutive” (2009, p. 59) and identity is understood as “the way a person understands his or her relationship to the world, how that relationship is constructed across time and space, and how the person understands possibilities for the future” (Norton, 2013, p. 4). Nevertheless, what Norton (2013) describes as ‘students’ positioning’ should be also considered as a factor within identity politics which may play an important role in L2 motivation. Aside from this, more traditional concepts of identity should be accounted for in the definition of ‘identity’: “learner status, race, ethnicity, gender, class, age and social status might mediate a learner’s access to linguistic resources, and especially, to interactional opportunities in the second/foreign language” (Gu, 2009, p. 60).

Concerning agency and structure, sociological theories account for four different perspectives of the agency-structure relationship in regards to L2 motivation research (2009, pp. 60-62):

1. Structuralist theory: human beings are determined by social structures and L2 motivation is influenced by the outcome of this socialisation.
2. Interactionist theory: primacy of agency over structure.
3. Structurationist theory: agency and structure are intrinsically linked so no primacy is given to one of these elements (interdependent relationship).
4. Agents are able to reflect and create “the social arrangements that facilitate the realization of their own interests and ambitions” (2009, p. 61) while structure is “always anterior to learners and providing an enduring context for them” (2009, p. 61).

Poststructuralist theories regarding L2 motivation argue that there needs to be a jump from the conceptualisation of motivation to the matter of investment, understanding these as interrelated but different concepts. While motivation has been considered in depth, the

concept of investment goes a step further from motivation as “the notion of investment can map the relationship between power, identity and language learning in a changing social world in a deeper and more complex way than can the concept of motivation alone” (2009, p. 63). By making account of the concept of investment, language learning is seen as a transaction of values: learners’ time and dedication for language proficiency. This would be especially true concerning learners who seek a language certificate (instrumental orientation).

Regarding learners, the notion of the social ‘self’ should be considered within language learning motivation as a constant redefinition of the concept of the ‘self’ influenced by their social context and their impressions as well as attitudes. It should be reflected on this point Csizer & Dörnyei’s (2005) concepts of the ideal and ought selves as the social self would lean toward the ought self in terms of ‘commitment’ to society, that is, what it is expected of them by social and even cultural forces (e.g. family, ethnicity, identity, etc.) would shape the social self and their language motivation.

However, the social self does not exist in a vacuum, but learning involves a socialising process within a community. Communities of practice refer to the process a learner experiments from a peripheral participation to full participation (2009, p. 65). In order to become part of the community, Wenger (1998) proposes three modes of belonging:

- Engagement: participation in a shared practice within the community.
- Imagination: going further than learners’ own experiences and perceptions.
- Alignment: coordination between members of community.

Therefore, social interaction and social belonging are issues that need to be considered in L2 motivation. From Gardner’s social-psychological approach to poststructuralist uptakes on L2 motivation, this field has seen much advancement in the last decades always building up on previous studies to reach a deeper understand of the factors playing a role in learners’

motivation. It has been pointed out the need for a multi-level approach to L2 motivation (Gu, 2009) so to provide to all variables within the groups studied in empirical research of the topic. Thus, research on L2 motivation and its theories is likely to continue growing in the following decades.

#### **4.2. Cognition and Language Awareness**

The interrelationship between affect, cognition and motivation has become a stated fact in the last decades with the cognitive-psychological approaches to motivation making explicit reference to the cognitive processes in L2 motivation (Dörnyei & Ushioda, 2011). This relationship has been referred to as the *trilogy of the mind* (Waninge, 2014) in order to justify the psychological nature of the triad in which emotions and perceptions need to be accounted for. In addition to this, bilingual individuals such as Galician students and foreign language learning should be considered in this trilogy.

Firstly, the executive function needs to be accounted for in regards to bilingualism impact in the individual in terms of (1) inhibitory control, (2) working memory or updating, and (3) cognitive flexibility (Bialystok & Barac, 2013, p. 202). Taking as a basis point that bilingualism improves cognition functioning (Mehisto & Marsh, 2011), it is believed that bilingualism “increases the cognitive load that the bilingual individual can handle at one time, that it improves episodic and semantic memory, increases metalinguistic awareness, and encourages the development of higher-order problem-solving skills” (2011, p. 30). Therefore, this would mean that the management of two languages leads to pivotal changes not only in language proficiency but in non-linguistic cognitive issues as well.

In order to understand how the mind of the bilingual works, Cook (2012) coined the term *multicompetence*:



[It] involves the whole mind of the speaker, not simply their first language (L1) or their second. It assumes that someone who knows two or more languages is a different person from a monolingual and so needs to be looked at in their own right rather than as a deficient monolingual, an idea put forward by Grosjean (1989) from a different background. Multi-competence is thus not a model nor a theory so much as an overall perspective or framework: It changes the angle from which second language acquisition is viewed. It constitutes a bilingual ‘wholistic’ interpretation of bilingualism as opposed to a monolingual ‘fractional’ interpretation of bilingualism. (2012)

This breaks the idea that the bilingual could be considered a monolingual plus adding the L2 proficiency, but an entity on their own influenced and shaped by both language learning processes. Thus, the additional cognitive demand of managing two languages results in an improved executive function (Mehisto & Marsh, 2011, p. 33) which can be appreciated in bilinguals’ metalinguistic awareness and their problem-solving abilities (cognitive flexibility).

As CLIL is considered a high demanding cognitive methodology due to its dual-focused approach to content and language, some scholars have raised concerns on whether this method may not work as some students may feel cognitively overloaded, thus, their learning process may be impaired (Otwinowska & Forýs, 2017, pp. 473-474). On the other hand, Mehisto and Marsh (2011) point out that “[a]s language learning requires considerable time, it is heartening that research seems to indicate that even low levels of second language learning can positively impact on the brain leading to increased metalinguistic awareness [...] This has positive implications for a cognitively demanding approach such as CLIL” (p. 36).

It cannot go unnoticed that the metalinguistic awareness found in bilingual individuals allows for a deeper perception of the world (e.g. finding ambiguity in speech) and understanding that words may have different meanings (2011, p. 35). It has been long proved the relationship of bilingualism with proficiency in subjects such as Physics and Mathematics (Farrel, 2011; Tumié, 2012). Therefore, the implementation of a CLIL methodology where scientific content and language are integrated could lead to a dual purpose concerning cognitive advantages: to develop bilinguals' problem-solving skills and to bring to heel language awareness in the non-linguistic classroom in a natural environment.

Marsh (2008) highlights curricular pressure as a factor to consider in the CLIL classroom and students' motivation: (1) a desire to communicate with people from the target culture (integrative orientation); (2) the effects of the classroom context, instructional techniques and attitudes towards the course and the teacher (pedagogical concerns); and (3) students' linguistic confidence (p. 235). These factors are closely linked to the concept of language awareness as students understand language as an instrumental tool (1) which can influence the learning process (2) and also their own perception of their language abilities (3); thus, making language become meaningful as it becomes part of their reality.

In regards to language awareness and cognition, Nieto Moreno (2016) points out that CLIL enhances students' cognitive flexibility, cognitive engagement, cognitive functioning, problem solving skills and higher order thinking (p. 23). Concerning content learning, quantitative studies have been carried out on whether CLIL benefits non-linguistic content learning with different results: some studies show no differences between content learning in CLIL and non CLIL groups (Dalton-Puffer, 2008) while others conclude that non-CLIL students outperform their CLIL counterparts in content assessment (Fernández Sanjurjo, Arias & Fernández Costales, 2016; Fernández Sanjurjo, Arias & Fernández Costales, 2017). Notwithstanding the different background contexts that may influence content learning,

Dalton-Puffer (2008) points out that “CLIL students work more persistently on tasks, showing higher tolerance of frustration, thus acquiring a higher degree of procedural competence in the subject” (p. 4). Therefore, it could be argued that the inhibitory control which is part of the executive function allows CLIL students to overcome bouts of frustration in order to reach their content-related goal though some further research needs to be carried out.

Concerning language in CLIL, Nieto Moreno (2016) makes echo on studies done up to the moment which argue that “the integrated curriculum is more effective in the acquisition of a second language than traditional EFL classes” (p. 22). Nevertheless, according to different studies, not all language areas benefit from CLIL (Dalton-Puffer, 2008; Ruiz de Zarobe, 2011):

Benefited Language Areas	Unaffected Language Areas
Receptive Skills	Productive Vocabulary
Vocabulary	Informal Language
Morphology	Writing (e.g. accuracy, discourse skills)
Creativity	Pronunciation
Fluency and Quantity	Syntax
Emotive and Affective Outcomes <sup>5</sup>	

Table 1: Language areas affected/unaffected by CLIL. Based on research by Dalton-Puffer (2008, p. 5) and Nieto Moreno (2016, p. 22).

It cannot go unnoticed that receptive skills such as reading and listening are benefited in CLIL lessons due to the instrumental nature of the foreign language and its place in the lesson background context: students are constantly exposed to the language by means of materials in the foreign language and the teacher’s explanations. In regards to the benefits

<sup>5</sup> These will be further developed in Chapter 4.3

shown in the vocabulary area, it could be argued that vocabulary is explicitly dealt with in the CLIL lesson (explicit knowledge) as an important part of the language of instruction; thus, “through studying content subjects in the foreign language CLIL learners possess larger vocabularies of technical and semi-technical terms and possibly also of general academic language which gives them a clear advantage over their EFL-peers” (Dalton-Puffer, 2008, p. 6). Furthermore, morphological low-level processes such as the third person *-s* and the regular past *-ed* become automatised (Ibarrola, 2012). Concerning creativity, fluency and quantity, Dalton-Puffer (2008) associates these benefited areas in CLIL to positive affective outcomes: “after a certain amount of time spent in CLIL lessons the learners seem to lose their inhibitions to use the foreign language spontaneously for face-to-face interaction” (2008, p. 6).

However, research up to the moment has proved that not all areas of language are benefited from a CLIL methodology; for instance, pronunciation has not been found to improve CLIL students’ skills in this area (Pérez Cañado & Lancaster, 2017), probably due to the fact that it is not explicitly dealt with in the CLIL classroom and the need for long-term exposure in order to create a change in the learners’ pronunciation skills. Concerning other language areas, some aspects of writing and complex syntactical structures are not found to be influenced by CLIL methodology which Dalton-Puffer (2008) argues it has to do with low writing skills (even in the mother tongue) and a lack of explicit explanation in the classroom (p. 7) respectively. It could be also argued that the language of instruction and the microfunctions of language are not adequately implemented in the lessons. Even though it is clear that lexicon is the main area positively influenced by CLIL, not all lexical items meet this requisite: although academic language proficiency has been proved (Lorenzo & Rodríguez, 2014), informal language has not benefited from CLIL; this can be explained by

reflecting on the type of language used in the classroom as a great deal of it is considered academic language.

Aside from the language goals CLIL promotes, the development of learning skills cannot go unaccounted as part of implicit learning techniques. In order to address the learning to learn competence in 2<sup>nd</sup> year of ESO students in Castilla La Mancha from CLIL and non CLIL groups, Nieto Moreno (2016) carries out a study dealing with two dimensions: “learning and self-regulatory strategies” and “metacognitive strategies” taking into account the cognitive and metacognitive processes respectively (p. 26). Overall, CLIL students outperformed their non CLIL counterparts in both dimensions concluding that “CLIL students use cognitive and metacognitive strategies more than their non-bilingual peers [...]and that they successfully develop, according to the opinion of their teachers, lower and higher thinking strategies” (2016, p. 29). In addition to this, CLIL students are found to learn more with problem solving activities rather than more mechanical tasks (2016, p. 28) as the former ones are more cognitively demanding; thus, resonating with Mehisto & Marsh (2011) and their uptake on CLIL and cognition.

Having looked at some areas and skills are acquired through explicit or implicit means, it has become clear that CLIL promotes both explicit and implicit knowledge. However, according to SLA theories age is a significant factor in the acquisition of a foreign language which should be considered (de Groot, 2011; Herschensohn, 2013; Li, 2013). In regards to the acquisition of the mother tongue, the critical (or sensitive) period hypothesis refers to an optimal time period for L1 acquisition that goes from early childhood to early adolescence (from age 2 to age 12; Herschensohn, 2013, p. 317).

However, it has been less clear whether there is a sensitive period for L2 learning considering that the higher the age of acquisition the lower the language proficiency (2013, p. 317). Concerning a L2 categorical critical period uptake it has been stated that there is:

[n]o empirical corroboration for a single definitive age of terminus for a critical period since research shows that different subdomains of language are affected at different ages [...and] true periods are strictly biological and linked to maturation, whereas L2A is impacted by a range of non-biological factors [...] Finally, the distinct roles of maturation and experience in L2A cannot be separated, and some scholars maintain that the latter – exposure to the TL – is more important than the former. (2013, p. 320)

Therefore, external factors such as exposure may play a significant role to L2 learning, though not in the same form of L1 exposure during the maturation years. Even though there is no clear critical biological period for L2 learning, it has been pointed out that there is a “maturationally sensitive period for L2A, which offset decline beginning at age 4, and steeper decline occurring through the teen years, but with no definitive terminus” (2013, p. 320).

Furthermore, a shift in cognitive functions has been studied having in mind the implicit and explicit learning dichotomy (DeKeiser, 2008) and the “less is more” hypothesis (Johnson & Newport, 1989): the less developed the cognitive capacity (young learners) the more learning advantages in regards to gradual and implicit learning (Li, 2013, p. 149). In contrast to this, higher cognitive capacity in adults results in the use of “explicit analytic procedures in dealing with complex aspects of language” (2013, p. 149). Nevertheless, this does not mean that implicit learning can only be found during the early stages of life, but both implicit and explicit learning are present in L2A no matter the learner’s age. However, it is true that adult learners prefer explicit knowledge of the language as their awareness of

language is higher in most cases, especially when learning a foreign language for instrumental reasons.

In addition to the maturation of the brain, some other variables need to be accounted in the acquisition of a L2 in contrast to L1. Herschensohn (2013) points out external influences such as education, literacy and amount of input as well as individual characteristics (e.g. sociocultural identity) which may influence the L2 learning process (p. 334). Concerning this, the learner's situational context should be accounted in terms of L1 and L2 as well as how these are influenced by linguistic policies and the linguistic reality. This may lead to some discrepancies between the two entities (policies and reality) due to sociolinguistic issues such as in the Galician case.

Having already considered the sociolinguistic situation of Galicia (Chapter 3), this should be contextualised in regards to foreign language learners. It has been stated that two languages are official in the Galician territory (Galician and Spanish); however, their official status differs from the sociolinguistic reality of the autonomous community. Even though the linguistic situation of Galicia in the legal framework caters for equal bilingualism (both languages have equal nature and there is no prestige variety), the linguistic reality does not reflect the legal framework; Galician and Spanish are not used indistinctively nor they are used equally, therefore, many have considered Galicia a *diglossic* community.

Language use has ideological implications in the Galician territory; many still link Galician with the lower classes and do not consider it a suitable language for academic or professional purposes. This appreciation of the Galician language in the 20<sup>th</sup> century has resulted in a decline of the number of people who speak Galician, especially young population. Receptive skills aside, the strongest impact to Galician language has been found in the productive skills (speaking and writing) with some pointing out to the seemingly

artificial normative Galician (contrasting with the traditional Galician used by native speakers) as a downside for Galician usage (*Consello da Cultura Galega*, 2017, p. 18).

This decline of Galician and its users calls for a reconceptualization of the type of bilingualism found in the community with many Galician people categorised as passive bilinguals; they may be surrounded by Galician and have native-like understanding of the language but they do not use the minority language. Therefore, they may be considered *pseudobilinguals* in the sense that their skills are further developed in one language. This would mean that, even though the legislation caters for a balanced bilingualism, the sociolinguistic reality is one of ‘pseudo-equal’ bilingualism as the two languages are not used ‘equally’ or perceived to have the same prestige.

This sociolinguistic reality needs to be accounted for in educational terms and to what extent this pseudo-bilingualism would influence Galician students’ foreign language learning. To start with, the Spanish educational legislation promotes foreign language learning from the early stages of mandatory education onwards and awareness on the importance of English as a lingua franca (Tabuenca Cuevas, 2016) has risen at par with globalisation. These facts have led to an exponential increase in foreign language acquisition, in which the concepts bilingual and multilingual have become a necessary, if not desirable, reality. According to Lorenzo, Trujillo & Vez’s (2011) types of bilingualism, this promotion and encouragement of second language acquisition fits into the additive bilingualism category.

In addition to this uptake on foreign language, it should be considered whether English in Galicia is a L2 or a L3. In order to tackle this issue, three variables should be accounted: (1) situational context, (2) language proficiency and (3) language perceptions:

1. Situational context: the most external and easily observable variable. Different situational environments are present in the Galician territory (urban, semi-urban,



semi-rural and rural). Language usage (Spanish and Galician) is often conditioned by the context (e.g. Spanish is mostly used in urban context while Galician is relegated as an unlikely option). Even though all public schools need to follow an ‘equalising’ policy regarding language use, the classroom reality may differ from the legislation depending on the school’s surrounding situational context.

2. Language proficiency: balanced bilinguals. Addressing language proficiency in Spanish and Galician may be controversial considering the many variables while assessing languages. Comparing results on linguistic competences for both languages in schools and high-schools may throw some light on the matter, though there may be some shortcomings on how to effectively assess language proficiency by quantitative means. It is also worth mentioning that the concept of bilingualism as a linguistic system with the same level of proficiency in two languages may be challenging if the different language skills (reading, listening, writing and speaking) are measured: equal scores on all may be impossible.
3. Language perceptions: some perceptions on language shape language usage as well as language awareness (e.g. Spanish as the language to use on a doctor’s appointment). Depending on this unconscious (and even conscious) use of languages, students may feel that one language is less important than the other. In the last study done on the topic of linguistic attitudes and awareness in Galician youths (*Consello da Cultura Galega*, 2017), the participants show awareness on the linguistic situation of Galician and desire to improve it, they show low commitment to do so (pp. 54-55).

These variables do not give a clear answer to whether English should be considered a L2 or a L3 due to the great diversity within the Galician territory. Galician has been promoted from official sources and this has resulted in greater awareness to the linguistic situation in Galicia. Therefore, even though language use may be decaying in some demographic sectors,

language awareness is rising. This along with contextual variables (e.g. administration, school, etc.) may give hope to think of Galician as an L2 with all the cognitive advantages bilingualism represents. Therefore, it could be argued that English is indeed a L3 in Galicia, though the influence of the L2 may differ greatly from one group to another.

### **4.3. Affective Factors in CLIL**

Human development relies on variation; whether these variations are a product of natural (e.g. biological maturation) or artificial causes (e.g. regulated learning) it is difficult to point out how and to what extent the variable may influence human development. However, there are predictable tendencies –often referred to ‘stages’–that may be accounted (Verspoor, 2014). In order to do so, language developmental research needs to consider what Verspoor (2014, p. 39) defines as ‘initial conditions’ (conditions showing a high degree of variability) and attractor states (more stable ‘stages’ of development) within the dynamic system theory. This would lead to an understanding on the human and language developmental process that goes from an initial variability towards a subsequent stability. In pedagogical terms, learners may have different trajectories due to initial conditions and their individual relevant variables such as the individual’s personality type, the level of proficiency at the beginning of the study, contextual issues, attitudes and motivation (2014, p. 45).

According to Dörnyei (2009a), these factors do not exist on a vacuum, but they act as integrated systems; therefore, he proposes the term ‘conglomerates’ so to point out the integrated and interrelated nature of the different factors playing a role in motivation. Concerning the combination of motivational, cognitive and emotional factors, Dörnyei (2009a) outlines four motivational conglomerates:

1. Interest: the most explicit motivational factor. Curiosity and engagement are cognitive-based elements found within its definition.

2. Productive learner role: learner's place in a dynamic group situation and their performance.
3. Motivational flow: "a state of intensive involvement in and focused concentration on a task that feels so absorbing that people often compare it to being outside everyday reality" (2009a, p. 3).
4. Vision: linked to the concept of 'ideal-self'. Learner's perception on what they would like to become in regards to their learner persona.

Nevertheless, different attractor states and conglomerates can be found in different research settings depending on their aims and the study group. Waninge (2014) identifies attractor states by studying classroom experiences perceptions by means of interviews to a homogeneous group:

- Engagement: learners are immersed and focused on the task leading to "a loss of self-consciousness and distortion of time" (2014, p. 197) which is linked to the concept of 'flow'.
- Interest: the most frequently mentioned state in Waninge's study (2014), the definition of 'interest' is a controversial topic though it encompasses affective, cognitive and motivational processes (p. 197). Overall, Waninge defines it as an "active engagement and enjoyment combined, leading to more active participation in the on-going learning activities" (2014, p. 201).
- Anxiety: related to fear, worry and even frustration, anxiety has been studied as being a negative variable on learning processes from a linguistic and cognitive perspective (Gürsoy & Akin, 2013; Sylvén & Thompson, 2015).
- Boredom: "a state composed of unpleasant feelings, a lack of cognitive stimulation and low physiological arousal, a sense of time passing slower than usual and a

tendency to disengage from the activity” (Waninge, 2014, p. 198). Boredom may be given by a lack of challenge, information overload or low interest on the topic.

- Neutral attention: neither boredom nor interest, it is an attractor state defined by passiveness towards the learning situation (or object). It could be linked to the concept of ‘amotivation’ in cognitive psychological approaches to motivation.

In regards to affective factors and attractor states in the CLIL field, some research has been carried out recently (Seikkula-Leino, 2007; Fernández Fontecha, 2014; Heras & Lasagabaster, 2015; Lasagabaster & Doiz, 2015) with the common idea that “language learning and motivation benefit from each other in a CLIL context” (Fernández Fontecha, 2014, p. 24). Affective factors such as general, extrinsic and intrinsic motivation (Fernández Fontecha, 2014), self-esteem and motivation (Seikkula-Leino, 2007; Heras & Lasagabaster, 2015), and anxiety, goal orientation, effort/expectancy and parental encouragement (Lasagabaster & Doiz, 2015) have been studied in CLIL literature. Having already taken a look at types of motivation in this chapter, some other factors will be considered in the following lines:

- Self-esteem: individual’s psychological construct related to self-concept though “[t]he main difference between self-concept and self-esteem is that the latter is also connected to the individual emotional factors. As opposed to self-esteem, self-concept is a more objective description of oneself” (Seikkula-Leino, 2007, p. 333). Furthermore, the idea of academic self-concept (Trautwein, Lüdkte, Köller & Baumert, 2006) needs to be considered due to the educational nature of the learning process and CLIL learning in particular.
- Goal orientation: based on Gardner’s (1985) concepts of integrated and instrumental motivation. Due to the specific context of the CLIL groups (no contact or clear identification with the L2 community), integrated motivation has not been considered

in CLIL studies; the focus is on instrumental orientation (Lasagabaster & Doiz, 2015, p. 6).

- Effort/expectancy: effort is defined as “the motivational strength or intensity the individual exerts on language learning” (2015, p. 7). It may be constructed around the idea of goal achievement while expectancy relies on the idea of increasing autonomous L2 learning throughout time.
- Parental encouragement: as one of the main maturational influences on young learners’ development, parents’ involvement and attitudes towards the CLIL learning process may influence motivation positively or negatively: learners may feel pressured to achieve certain academic levels; thus, reflecting on the social construct of the ought-to L2 self (2015, p. 7).

It may be noticed the last considered factor (parental encouragement) as an ‘external’ force: it is not an inner quality to the individual. In contrast, other affective factors such as self-esteem and effort deal with the learners’ intrinsic process. Therefore, some external and contextual factors may play a significant role in the learning process. Regarding CLIL regulated learning, some issues may be worth mentioning such as classroom dynamics, teacher’s profile and short-term/long-term development:

1. Classroom dynamics: as a starting point, it must be mentioned that CLIL encourages group and pair work learning so to tackle communication and language (two crucial points of this methodology). However, many variables can be accounted in the classroom that may challenge this idea: students’ ratio, suitable classroom space and materials are some of them. Taking as a basis point that learners would benefit from a ‘communication-friendly’ environment and the fact that learners are social beings, it could be argued that classroom dynamics, that is, relationship-based interactions (e.g.

group work, task-based approach etc.) would enhance affective factors such as motivation.

2. Teacher's profile: aside from their language proficiency and content-related knowledge, the teacher's profile needs to be accounted in terms of teaching style, classroom presence and language usage. Some research has been carried out on the topic (Moate, 2011; Escobar Urmeneta, 2013) concluding that the CLIL teacher personae differ from their non-CLIL teaching practice as "teachers cannot always rely on familiar techniques and methods. This impacts the emotional experience of teachers and actual classroom practice" (Moate, 2011, p. 337). Furthermore, the absence of humour due to language difficulties and the teacher's 'artificial' attitude is reported as a major drawback (Moate, 2011) to 'bond' with students and create a relaxed environment. In addition to this, Escobar Urmeneta (2013) points out that teacher-led interactions and their reflection on their practices as significant factors to consider in order to promote communicative situations among learners. Therefore, the teacher's presence in the classroom may influence to a great extent the communication taking place during the lesson as well as classroom environment; thus, reflecting on learners' level of comfort and predisposition towards the course. This would mean that learners would be emotionally influenced by the teacher's profile (e.g. an unapproachable-looking teacher would result in 'feeble' communication on the students' side both content and social wise).
3. Short and long-term development: related to goal achievement, any type of learning caters to different goals concerning timing. For instance, the long-term aim of CLIL is to allow students to acquire content and language goals, though a short-term aim in a CLIL lesson could be less ambitious (e.g. students understand a content-related text in the language of instruction). Short and long-term development work in a similar line;

students may not be aware of a long-term developmental process concerning the foreign language, but they may be more conscious of short-term goals and their acquisition (e.g. carrying out a presentation). This would mean that by enhancing the importance of these short-term goals (and giving feedback), students may feel positively predisposed towards the subject and CLIL methodology as this development-based awareness would influence affective outcomes bearing in mind that “motivation [in sustained long-term activities] does not remain constant during the course of months, years or even during a single lesson” (Dörnyei & Ushioda, 2011, p. 6).

However, it is worth mentioning that contextual variables are not to be studied on their own when it comes to affective factors, but individual differences should be also accounted for, though they may pose some research-related concerns. Taking as a standpoint human variation, the term *individual differences* (IDs) should be understood as “characteristics or traits in respect of which individuals may be shown to differ from each other” (Dörnyei, 2009b, p. 181). Research into individual differences is often based on the concept of stability (2009b), that, is, the perceived stable nature of these concepts as intrinsic to the individual. Therefore, “ID constructs refer to dimensions of enduring personal characteristics—or traits—that are assumed to apply to everybody and on which people differ by degree” (2009b, p. 181).

Concerning SLA research, language aptitude, motivation, learning styles, learning strategies and anxiety are traditional IDs which apply to everybody in a different measure. However, Dörnyei (2009b, p. 184) states that this selection lacks three personality facets: emotions, interests and general knowledge. Having already considered the concept of ‘interest’ in this chapter, emotion and general knowledge should be accounted as individual factors:

- Emotions: often considered transient states, emotions have been dealt with as psychological and cognitive individual elements which fluctuate over time due to external influences and inner struggles within the individual. However, some scholars argue that individual emotional patterns and predisposition are quite stable (Rosenberg, 1998; Keltner & Ekman, 2000); therefore, they should be studied in L2 learning as “the process of learning an L2 is known to be emotionally highly loaded” (Dörnyei, 2009b, p. 184).
- General knowledge: “the amount of domain-specific knowledge that that person has acquired in the past” (2009b, p. 185). Concerning CLIL, the domain-specific knowledge is defined by the content of the subject (e.g. Physics) which would also be influenced by the learner’s interest on the topic. In regards to the language of instruction in CLIL, some degree of language proficiency –thus, language knowledge– becomes part of the general knowledge used in the lesson, though from a highly instrumental perspective.

Nevertheless, ID factors cannot be considered fixed categories as it is not possible to generalise “across situations and time, since even genetically inherent characteristics interact with environmental factors, displaying an integrating impact” (2009b, p. 189). Their multicomponential nature along with their lack of stability and context independence (2009b) has resulted in what Dörnyei (2009b) describes as the ‘individual differences myth’; research has tried to achieve two contradictory objectives: “to understand the *general principles* of the human mind and to explore the *uniqueness* of the individual mind” (2009b, p. 181).

Notwithstanding the traditional ID factors in psychology-led research, SLA research needs to consider affective and individual factors which may be relevant to gather data on foreign language students. Taking into account the emotionally charged environment in a foreign language lesson, students’ perception of the target language and their subconscious



attitudes attached to it may be worth exploring. However, as any non-straightforward element, researching subconscious attitudes to the foreign language may be difficult to deal with in a group, especially considering the different situational and individual profiles. Furthermore, it would be challenging to point out to what extent these attitudes influence the learning process.

Another issue to be considered within the SLA framework and affective factors in CLIL is students' perceived competence. Metalinguistic awareness in bilinguals has been mentioned (Chapter 4.2) from a distinctly cognitive point of view. Nevertheless, it has to be considered within the student's emotional state; for instance, a student who perceives their level on the language of instruction as low would feel discouraged during the CLIL lessons in which the foreign language is the vehicular language. On the other hand, a student with a high perception of their own language proficiency would feel comfortable (and even challenged) in the CLIL group.

Linked to cognitive perceptions and motivation in the EFL classroom, Henscheid (2015) studies this relationship by considering Burns' (1980) cognitive distortions in order to "identify thoughts that might negatively affect students' motivation and attitudes towards studying English" (Henscheid, 2015, p. 12). These distortions (Burns, 1980, pp. 42-43) could be contextualised to the CLIL methodology and CLIL students as follows:

1. All-or-nothing thinking: performance results are understood in black-and-white, either they are perfect or they should be considered a failure. For instance, the CLIL learner understands everything in a content-related text in the language of instruction but one sentence; this slight difficulty makes the learner think they have not achieved the text's goal (e.g. understanding the text).

2. Overgeneralisation: one negative event is seen as a long-term pattern of negative outcomes. A CLIL student may need to switch to the mother tongue to explain a concept; thus, becoming distressed and thinking their speaking skills are not good.
3. Mental filter: dwelling on a negative detail and creating a bleak vision of reality. Student is not able to complete an exercise so they think they are not good at school.
4. Disqualifying the positive: positive experiences are not given enough credit. An example of this is a student getting a good grade on a paper in the language of instruction, though they do not think much about it as it is 'just' a paper.
5. Jumping to conclusions: making a negative interpretation of events even though there are not objective data to back up that idea. Burns (1980) divides this distortion into two subdivisions:
  - a. Mind reading: concluding that someone is reacting negatively towards you with no objective clues to support the argument. This may be very common in any classroom with the usual 'That teacher hates me' diatribe.
  - b. The Fortune teller error: anticipating negative outcomes and feeling secure on the veracity of your claims. For instance, a CLIL student may know the answer to a question the teacher asks, but does not dare to answer it because they think they will mess up if they answer in the foreign language.
6. Magnification (catastrophizing) or minimisation: exaggerating or minimising the importance of things, e.g. student may feel their achievement is not as great as their peers because their [the peers] presentation was more difficult than theirs.

7. Emotional reasoning: believing that your negative emotions reflect reality. Therefore, a student who feels stressed may think that classes are stressful.

8. Should statements: motivating yourself by drawing different ‘should’ and ‘shouldn’t’ statements. In case you do not achieve those, the emotional consequence is guilt. For instance, CLIL students may feel they ‘should’ study more hours for the CLIL subject due to the extra challenge of the foreign language and, if they do not, they feel guilty.

9. Labelling and mislabelling: “an extreme form of overgeneralization” (Burns, 1980, p. 43). Attaching a pejorative label to yourself after making a mistake (“I fell, I’m such a klutz”) or to others (“The teacher is a pushover”). Mislabelling consists of describing an event with emotionally-charged language: “The lesson was boring because I didn’t understand a thing”.

10. Personalisation: the self is considered the cause of an external negative outcome even though they were not primarily responsible. A possible case scenario of this distortion could be as follows: a CLIL student may ask the teacher to translate a concept into the L1; later the CLIL teacher may repeat a difficult concept in the mother tongue and that student may feel this was done because of him.

These cognitive distortions provide an overview of some processes and elements which may influence the learning process as well as students’ affective filter. Having considered the close relationship between affectivity and cognition, it must be concluded that any study in motivation should tackle these concepts. Nevertheless, IDs (individual differences) may make the study of these factors particularly challenging.

Different affective factors may be found in the CLIL classroom due to the learning process nature and the additional emotional charge of the CLIL methodology: contents are taught in a language other than the L1 (or L2 in bilingual environments such as Galicia);

different assessment practices; communication may be more strained due to linguistic issues, etc. Notwithstanding the different affective factors concerning CLIL, it is clear that motivation plays a significant role in content learning and SLA as “an increase in students’ motivation towards additional languages and an improvement in language competence take place via CLIL methodologies” (San Isidro, 2010, p. 62).

#### **4.4. CLIL Perceptions: Teachers’ and Students’ Insights**

CLIL as a ‘worldwide’ phenomenon has resulted into some discussion about the viability of its implementation (e.g. materials, resources) and its results (‘Does FL proficiency really improve thanks to CLIL?’). Overall, results and attitudes towards CLIL differ depending on the country where CLIL takes place and even the profile of the autonomous community may play a crucial role in perceptions and attitudes (San Isidro, 2017; see Chapter 3.3.); countries such as Austria and Finland in which CLIL is widely studied and reported to have good results (see Chapter 2.4) though others such as Spain recount different types of results especially in non-academic newspapers (Sanmartín, 2013; Marías, 2015; Setién, 2016).

These reports should not be set aside as they may reflect the public’s perception on bilingual education or even influence the collective’s mind. Any issue concerning education is set to bring controversy; as one of the main common elements to society (most people have received some type of regulated education), people may feel free to discuss education by reflecting on their own learning experiences which may lead to subjective conclusions. It should not be understood by this that the public’s opinion is not valid or objective but that it may be influenced by particular elements. Furthermore, these perceptions may help to understand the challenges CLIL needs to overcome in Spain in order to become successful. In

this line, the perceptions of CLIL teachers and students on the subject need to be considered as they are the main human sources influenced by CLIL.

Firstly, some considerations regarding the social world need to be given by paying attention to the individual and social dimensions used in psychological studies. Moreover, it should be accounted how motivation is influenced by these perspectives. In regards to social identity, Hogg, Abrams, Otten & Hinkle (2004) write:

A social group is a collection of more than two people who have the same social identity – they identify themselves in the same way and have the same definition of who they are, what attributes they have, and how they relate to and differ from specific outgroups. Group membership is a matter of collective self-construal—“we,” “us,” and “them.” Social identity is quite different from personal identity. Personal identity is a self-construal in terms of idiosyncratic personality attributes that are not shared with other people (“I”) or close personal relationships that are tied entirely to the specific other person in the dyadic relationship (“me” and “you”) (2004, p. 251).

This division leads to question whether the CLIL teacher’s perceptions (and to some extent students’) are influenced by their social or personal/individual persona. Following the societal perspective, some issues such as sociocultural norms, intergroup relations and assimilation processes (Dörnyei & Ushioda, 2011, p. 7) should be considered. In this case, the CLIL teacher’s perspectives may be influenced by their previous teaching experience (even the non CLIL one), their place within the school (e.g. substitute teacher, CLIL coordinator, etc.), the school’s involvement in the CLIL programme and the institutional support they receive among other factors.

Regarding the individual perspective, Dörnyei & Ushioda (2011) comment on the social context as:

the complexity of the social environment is only important inasmuch as it is reflected in the individual's mental processes and the resulting attitudes, beliefs and values [...that is] how individuals process and store information about other people and how these mental processes affect their interaction. (2011, p. 7)

Therefore, the CLIL teacher's perspective may be influenced by the type of students in the CLIL classroom (e.g. in bilingual schools highly motivated students enrol in the bilingual section) and even the 'connection' the teacher may feel with that particular group of students (e.g. generally, teachers often report feeling more comfortable teaching at some specific groups). Furthermore, the teacher's own relationship with the language of instruction (level of proficiency, learning methodology) as well as the time they need to dedicate to it: adapting materials, translating concepts, and going to refresh courses are some of the tasks that come with the preparation of CLIL lessons which may take a toll on the teacher; thus, influencing their perceptions.

### *CLIL Teachers' Perceptions*

There are some issues which may directly influence CLIL teachers' uptake on the methodology. Based on the fact that individual differences play a role in their perceptions of the teaching process, some general aspects are common to all CLIL teachers as influencing factors to their work. This is especially interesting considering the traditional figure of the teacher as a 'lone wolf' which has been challenged by a more social and collaborative type of teacher (e.g. cross-curricular projects and coordination among teachers). Taking as a starting point that CLIL promotes interdepartmental coordination, it could be argued that the 'traditional' teacher may feel uncomfortable asking for help from the CLIL coordinator or the language teacher; this may result in negative perceptions on the CLIL teacher's side based on the difficulties they may find by working alone.

Overall, there are some factors which may alter the teacher's insight to CLIL such as:

- **Administration:** government support is essential in order to implement CLIL. Economic support is one of the main elements necessary in order to run a CLIL section be it in a bilingual or plurilingual school. Nevertheless, some other pedagogical issues fall under the government's jurisdiction such as the public offer of CLIL-focused and refresh courses to which teachers may feel they are not enough or lack usefulness. Furthermore, professional recognition may be important to consider (e.g. the *Xunta* gives a 50-hour certificate to CLIL teachers). Regarding the school administration, teachers may perceive differently the support given by this administration (e.g. timetable, material resources available, etc.) though some longitudinal studies report both sides: teachers feel they receive support from the administration (Alonso, Campo & Grisaleña, 2008); CLIL teachers perceive no institutional or peer support and feel they are not valued by the institution (Pladevall-Ballester, 2015).
- **Materials:** the debate on materials goes on beyond the CLIL methodology as the use of the book has been recently challenged by many with PBI methodology rising as a strong alternative to a book-focused methodology. In regards to CLIL, "CLIL teachers in the early stage of course development often comment on a shortage of ready-made resources and a consequent need both to find and to create learning materials" (Coyle, Hood & Marsh, 2010, p. 87). Even though the textbook is an often used tool in CLIL (pragmatic reasons and providing the teacher with some guidance as well as a 'safety net' could be some of the reasons), some adaptation is usually necessary to fit the specific CLIL group as well as the learning outcomes. Furthermore, adapting existing materials may not be enough; thus, CLIL teachers create their own materials designed to fit the subject and students (e.g. preparing more

problems so students prepare for their exams on their own). All these issues concerning materials may have an impact on the teacher's perception of CLIL, especially considering that their personal time would be used to create materials for the subject.

- **Assessment:** even though the issue of assessment in CLIL courses has been already mentioned (Chapter 3.4), some further thought should be given. One of the most basic concerns regarding CLIL is to what extent language should be assessed and if so. CLIL teachers' perception may vary greatly depending on how they understand CLIL. Overall, language is mostly considered a tool by CLIL teachers while the real focus is on content. This might be related to the concept of 'professional trespassing' (e.g. they do not feel it is their job to correct language issues) or a lack of confidence in their language skills (Aiello, Di Martino & Di Sabato, 2017). Nevertheless, their understanding on the role of language may impact the assessment as the language of instruction is to be adapted depending on the established learning outcomes.

Notwithstanding these factors, research has shown that CLIL teachers regard the CLIL experience as generally positive (Infante, Benvenuto & Lastrucci, 2009; Méndez García, 2014; Pladevall-Ballester, 2015; Pérez Cañado, 2016). Going a step further, Infante, Benvenuto & Lastrucci (2009) point out that the more experienced the CLIL teacher was the more positive they regarded the experience as "[i]t is evident that the teachers who have already overcome a series of difficulties are more inclined to see the general experience as extremely positive than the teachers who are still facing a series of obstacles" (2009, p. 159). This leads to a reflection on the CLIL implementation process carried out by the teacher and the challenges they had to overcome and shaped their teaching style. Furthermore, high levels of enthusiasm and motivation on the CLIL teachers' side play an obvious role in their perception of the CLIL methodology.



In regards to teachers' perception of students' language skills, the idea of using meaningful and real language in CLIL is presented (Infante, Benvenuto & Lastrucci, 2009; Pladevall-Ballester 2015). Language is considered a tool to communicate rather than the focus of the lesson, therefore, students pay more attention to the content (what they say) rather than the language (how they say it). According to this, students' initial fears about CLIL are gradually left aside by a rising motivational feeling towards the target language due to the fact that they perceive their language usage as real and contextualised as well as used for specific aims (2009, p. 161). Overall, teachers perceive an improvement in their students' language skills, specifically in oral comprehensions (Pladevall-Ballester, 2015, p. 56) though some concerns regarding low achievers are raised.

Concerning non-linguistic issues, CLIL teachers highlight cognitive-related gains in CLIL students as "CLIL learners are reported to think more critically and to undergo a constant process which invites them to restructure their mind schemes" (Méndez García, 2014, p. 37). According to CLIL teachers, different types of cognitive processes (see Figure 16, Appendix C: Chapter 4) are used by students in CLIL which facilitate the acquisition of contents: from lower order thinking skills (e.g. remembering and understanding) to higher order thinking skills (e.g. applying and creating) (2014). Furthermore, some social-related benefits have been pointed out by teachers such as teamwork skills (Pladevall-Ballester, 2015) based on the CLIL collaborative nature.

### *CLIL Students' Perceptions*

The study of student perceptions in CLIL has been a recent research topic which has resulted in different outcomes (Hunt, 2011; Pladevall-Ballester, 2015; Lasagabaster & Doiz, 2016; Recatalá, 2016; Otwinowska & Forýs, 2017). Taking into account the wide range of different factors that play a part in the CLIL experience, it is not surprising that disparate

results could be found. It must be considered that students' perceptions are highly influenced by emotional or affective factors and individual differences (e.g. interest, stress, anxiety, depression, etc.). Furthermore, the age and the maturation process may influence to some extent their perception of the CLIL experience.

Even though social identity may take part in these perceptions, research done to this point has focused on students' individual identity so to understand the gathered data (often using questionnaires) and reaching general conclusions on the topic, though it is true that some aspects of the social identity have been researched (e.g. teamwork; Hunt, 2011). Overall, there are some CLIL-related challenges which may influence students' perceptions:

- Content subject: even though there are many variables concerning CLIL subjects, a tendency towards social science and artistic subjects are found in primary CLIL groups while sciences are preferred in secondary education (Eurydice, 2006). This should be accounted in terms of students' interest in the topics as well as the 'suitability' of the subject; students' interest in the subject may be influenced by factors such as the teaching style, level of interaction and their perception of their level of usefulness. In regards to suitability, there are two issues which need to be raised: (1) the language of instruction and the academic functions of language will vary depending on the subject, thus, some subjects will probably have a wider range of academic functions than others; therefore, the language of instruction would be widely used. The second issue (2) deals with the perception of the subjects as 'serious' or 'non-serious' subjects. As an example of this Pladevall-Ballester (2015) states that "[t]he majority of parents were convinced their children learned just English in CLIL classes, which is one of the reasons why they thought CLIL should only be implemented in 'non-serious' subjects such as PE or arts and crafts just in case content is lost" (p. 56). In the same study, primary school children from science

and art lessons in CLIL defined different outcomes: while most of CLIL science students believed they had learned more content than vocabulary and language, the results for CLIL arts students were the opposite (Pladevall-Ballester, 2015, p. 51). Therefore, their perceptions on CLIL learning outcomes differed depending on the subject.

- **Timing and schedule:** the number of hours dedicated to CLIL may differ based on the academic year, subject and country/autonomous community. Furthermore, CLIL in bilingual communities is met with the challenge of implementing a third language of instruction and reducing the number of subjects with the L1 and L2 as languages of instruction, an issue which has caused some controversy (Lasagabaster & Doiz, 2016, p. 122). Aside from students' view of bilingualism and their use of the L1 and L2, some practical concerns should be accounted for such as the fact that the language of instruction may make the student's learning process more difficult due to low levels of proficiency in the language; thus, more hours of study would be necessary on the student's part. This could result in negative feelings (e.g. stress, anxiety, demotivation) towards the CLIL subject and the language, especially in the initial CLIL stages in which anxiety is a common factor (Pladevall-Ballester, 2015; Otwinowska & Forýs, 2017).
- **Communication:** one of the basic points of CLIL, communication is encouraged in the CLIL methodology by means of collaborative work. Notwithstanding the fact that the L1 (and L2 in bilingual environments) could be used to some extent, it is important to focus on the student's use of the language of instruction and the challenges this may present in their communication as an element which may influence their perception of said element. Firstly, it is necessary to point out that students and teachers alike think of CLIL as "a means of getting more exposure to English and having more

opportunities of using English for communication” (Lasagabaster & Doiz, 2016, p. 111). Furthermore, “the interactive nature of the [CLIL] lesson, speaking and taking part and developing language learning strategies” (Hunt, 2011, p. 374) also plays a role in how communication is carried out in the CLIL lesson.

Overall, CLIL students report feeling motivated and paying more attention in the lesson due to the extra challenge of the foreign language (Hunt, 2011; Pladevall-Ballester, 2015; Lasagabaster & Doiz, 2016). However, this is disputed in Otwinowska & Forýs (2017) who state that the high cognitive demands of CLIL make their study groups feel ‘intellectually helpless’ and this could lead to negative affectivity (p. 475). On a positive note, some elements such as the materials used (mostly of them authentic and/or adapted by the teacher) are reported to be a key element in the satisfaction with the CLIL subject (Hunt, 2011; Coyle, 2013; Recatalá, 2016); this is significant especially considering that it clashed with the low levels of general satisfaction with the CLIL course in Recatalá’s study (2016, p. 81).

In regards to satisfaction, students have pointed out the differences between language learning in CLIL and the traditional FL class. Students report CLIL lessons to be less ‘boring’ (Hunt, 2011, p. 372) than the foreign language lesson, probably due to the aforementioned ‘usefulness’ of the FL in the CLIL class. Furthermore, the fact that they perceive their CLIL FL learning to differ from the ‘normal’ FL lessons (Pladevall-Ballester, 2015, p. 49) may lead to conclude that this awareness is a product of an inner appreciation to what CLIL stands for in regards to pragmatic issues.

Concerning CLIL learners’ language awareness and self-perceived improvement, Lasagabaster & Doiz (2016) carry out a three-year longitudinal study in order to study these issues. In regards to self-perceived improvement, students reported that their level of English

had improved more in the CLIL classes than in the regular EFL classes (2016, p. 122).

Concerning language perceptions, it is concluded that:

[A]ll students placed considerable importance on reading, writing, speaking, and listening, as well as vocabulary, grammar and abilities to communicate in the L2 learning process in their first year of CLIL instruction. Grammar, however, is the least important element both for the younger and, especially, the older students. As the younger students progress in their CLIL instruction, the importance they attached to these language aspects decreased slightly [...and] [b]y the time the younger students had the same age as the older students, there are no significant differences anymore; all language aspects and skills are believed to be equally important. (2016, p. 121)

It is significant that CLIL students reach the same FL language impression after spending some years in a CLIL programme: all language skills are important. This result could be understood on the basis of cognitive maturation but also as a consequence of CLIL and the language awareness connotations this methodology carries.

To conclude, it is important to highlight that teachers' and students' perceptions may be influenced by many 'hidden' factors. Taking into account the different variables that come into play in human perspectives and the strong emotional connections with education-related issues, it is difficult to draw some general CLIL perceptions. This subheading has presented an overview of some factors and literature related to the topic, but more research needs to be carried out in order to acquire a broader perspective on CLIL teachers' and students' perceptions of the matter at hand.



## **CHAPTER 5: METHODOLOGY**

This chapter presents the methodological implications to the study as well as the ethical constraints linked to the data gathering process in the high-school where it took place. Firstly, some reasoning on the choice of methodology for this Ph. D thesis is given (5.1) which is to be followed by a comprehensive overview of the research methods (5.2): CAR (Classroom Action Research) and CA for SLA & CLIL (Conversation Analysis for Second Language Acquisition and Content and Language Integrated Learning). Then the research tools and the data gathering methods (5.3) are presented. Finally, the background context for the study is considered in terms of city location, high-school and participants (students and teacher) (5.4).

### **5.1. Conceptualising the Methodology**

CLIL literature and research has developed from theoretical issues to classroom practice studies in the relative short time this methodology has been implemented. It has to be pointed out the variety within these studies in terms of objectives, methodologies and results. Furthermore, the educational background context in CLIL is found to be a key element which influences the results as well as the data gathering process. Taking into account the current educational research panorama regarding CLIL, this study has sought to contribute to the rising and expanding literature in CLIL. In order to do so, some considerations and parameters were established.

Firstly, motivation in CLIL was chosen as the focal point of this study; this decision was taken considering the need for more literature on the topic and to complete (to some extent) the research done on this as “[t]his focus on affective elements is a welcome and necessary element of evaluation in the light of current evidence from psychological studies of the integration of the cognitive, motivational and emotional aspects of learning” (Coyle,

Hood & Marsh, 2010, p. 135). Nevertheless, motivation has been considered an unclear defined concept which has led to many theoretical studies but a relative small amount of practice-based research. Some quantitative studies have been carried out regarding affective factors and motivation (Heras & Lasagabaster, 2015; Lasagabaster & Doiz, 2015; Lasagabaster & López Beloqui, 2015). However, a qualitative approach to CLIL motivation has not been considered so far probably due to practical reasons (e.g. classroom observation is often challenging or doable to researchers): taking into account that “case study research comprises an intensive study of the background, current status and environmental interactions of a given social unit” (Brown & Rodgers, 2002, p. 21), it is not farfetched to think that ‘practical’ reasons would be the cause of the shortage of this type of studies.

This study takes a highly qualitative view of CLIL motivation in order to provide some qualitative data on the topic. In order to do so, some considerations were made in terms of research tools and data gathering. Taking into account the need for an in-depth analysis of the classroom reality, a systematic classroom observation was carried out to understand the CLIL experience using a hands-on approach. It was important for the aims of this study to compare whether the data from the quantitative tools (questionnaires) corresponded with the classroom reality and the teacher and students’ perception of CLIL and their own experience. Furthermore, some considerations in regards to motivation as an affective and individual factors were taken: motivation is not a constant phenomenon and it fluctuates, a fact which was proved by the systematic classroom observation throughout the time scope in which the observation took place.

Classroom observation allowed for an interpretative analysis of the data. However, in order to get more solid results, a statistical approach was taken by means of students’ questionnaires (to be discussed later). This dual approach was taken in order to cater to any discrepancies which may arise in the data analysis considering the subjective nature of



affective factors and its perceptions as well as to challenge any bias in the researcher's conclusions. Therefore, an interpretative and statistical analysis is carried out in order to build meaningful research data.

Concerning the studied group, some issues were considered when drawing out the methodology for the study. Firstly, some ethical constraints need to be mentioned: the participants' age was a major issue to tackle as the researcher could not be alone with the students' at any moment (only with the teacher present) so individual interviews were out of question. Furthermore, video recordings of the classroom and students are not allowed by law; therefore, only voice recordings would be used. However, due to the classroom's dimensions, voice recordings were not possible. Therefore, it was decided that the researcher would transcribe the in-classroom conversations. These constraints led to choose CAR as the main research method supported by CA for SLA and CLIL.

### *L2 Learning Process in Teenagers*

In regards to the CLIL group, it has also been considered the participants' age (teenagers) in the design of the study. It is widely accepted that age plays an important role in the acquisition of a foreign or second language. The so-called critical biological period related to L1 acquisition has been discussed regarding foreign languages (see Chapter 4.2.) though no clear results have been reached so far:

The existence of a critical period [regarding the L2] would have to be linked to a series of limitations which come up in L2 learning and, therefore, they would be linked to the problems found in classrooms from an educational point of view [my translation]. (Ruiz Calatrava, 2009, p. 99)

It should be also pointed out that no clear definition on where this period finishes has been agreed on as puberty is an in-between period, nor childhood nor adulthood. Research has shown adults and children learn a L2 differently: (1) the L1 learning process has not been completed in children but it has in adults, this facilitates to some extent the L2 learning process (Navarro Romero, 2009, p. 122); (2) brain plasticity is higher in children, thus, allowing for an unconscious assimilation of knowledge (2009, p. 123); and (3) different L2 learning approaches are traditionally used with children (e.g. interaction, total physical response) and adults (e.g. grammatical and analytical approach) which are related to cognitive issues in these different ages (2009, p. 123).

Concerning teenagers, Ruiz Calatrava (2009) states that “teenagers’ good results [in L2 learning] could be explained by understanding that they may benefit from both ways of learning [children and adult] thanks to brain plasticity at the beginning of this stage [my translation]” (2009, p. 102). Furthermore, “by keeping a constant contact with the L2, teenagers stand out over adults and these over children in regards to morphology, syntax and vocabulary [my translation]” (2009, p. 100). These could be facts which should be extrapolated to the case study presented as participants are in the first stages of adolescence and the CLIL methodology promotes constant contact with the L2 as the language of instruction as well as vocabulary learning related to the subject content.

In regards to the areas in which teenagers exceed compared to adults and children (morphology, syntax and vocabulary), this ‘overachievement’ could answer to teenagers’ psychological profile. Concerning teenagers’ thinking processes, it has been pointed out that they have reached the formal operational stage (Piaget & Inhelder, 1958) which is characterised by the ability to make hypothesis by using their abstract thought. This could be related to metalinguistic and metacognitive skills; hence, teenagers may use spontaneously

memorisation techniques which may help them with vocabulary learning and contrast new information with their knowledge of the L1 (González, 1991).

It has also come to attention the social aspects in the psychological development of teenagers as they “are deeply engaged in the construction of an organised identity, stable and coherent, which allow them to feel pleased with themselves as well as achieving social acceptance” (1991, par. 15). This resonates with the idea of the social self in motivation theories (see Chapter 4.1) as this stage is highly influenced by peer opinion and adult figures lose influence over teenagers; thus, ‘learning among peers’ becomes the main force in regards to social dynamics. Furthermore, this social uptake of the classroom situation may result in some issues such as ‘overidentification’ (associating oneself with other person and their traits; e.g. students may refuse to participate in one activity because their friends think it is boring) and feeling that they are observed by an ‘imaginary audience’ (students feel self-conscious in the classroom as they believe they are closely watched by peers; this may result in low participation due to fear of being ridiculed).

Social interaction has been found to be “essential in learning processes, not only because different linguistic skills are perfected but some social factors which enhance cognitive development come into play” (Navarro Romero, 2009, p. 118). Hence, interaction plays a crucial role in linguistic and cognitive development so it should be considered in FL learning. However, it should be considered the nature of said interaction and the type of language learned by teenagers in the classroom. Gu (2015) differentiates between academic language and social language: “academic language aligns with classroom discourse, textbooks, educational standards, and content-area assessments” (2015, p. 22) while social language refers to everyday informal speech. Therefore, this differentiation in the type of language used in the EFL and CLIL classrooms should be accounted in regards to social classroom dynamics: teenage students may feel more self-conscious using one of these types

of languages due to individual factors (e.g. shyness, difficulties with the content, etc.). Hence, the language used would be a factor in the learning process, students' social interaction in the L2 and motivation in teenage years; thus, these elements should be accounted for in the analysis of the quantitative and qualitative results gathered in this study.

#### *Qualitative and Quantitative Data: Mixed Methods Research*

As previously mentioned, this study has been primarily based on a qualitative methodology in order to explore the CLIL phenomena and motivation in a flexible manner and to consider the specific background for the study. Hence, qualitative data was gathered relying on the fact that:

Qualitative methods are typically more flexible [than quantitative methods] – that is, they allow greater spontaneity and adaptation of the interaction between the researcher and the study participant [...] In addition, with qualitative methods, the relationship between the researcher and the participant is often less formal than in quantitative research. Participants have the opportunity to respond more elaborately and in greater detail than is typically the case with quantitative methods. (Mack, Woodson, MacQueen, Guest & Namey, 2005, p. 4)

This 'elaboration' on the questions asked are to be found in the teacher's interview as the interviewee can ask the question to be rephrased and expand on their answer. This is also linked to the 'informality' of the setting and the relationship between interviewer and interviewee; they know each other from some time so the teacher would feel comfortable when answering these questions. Furthermore, this type of data collection focused on qualitative methods allows "the researcher the flexibility to probe initial participant responses—that is, to ask why or how. The researcher must listen carefully to what participants say, engage with them according to their individual personalities and styles, and

use “probes” to encourage them to elaborate on their answers” (Mack, Woodson, MacQueen, Guest & Namey, 2005, p. 4). Overall, this type of interview has a strong qualitative component as the teacher’s perceptions are considered; thus, it can be categorised within the affective evidence type of data (Coyle, Hood & Marsh, 2010, p. 136).

In regards to the students’ questionnaires, these are also categorised under the affective evidence. However, the nature of the gathered data from this tool could be defined as a blend of qualitative and quantitative data as the presented items collect statistical (quantitative) and interpretative (qualitative) information. The purpose behind the use of both types of data is to acquire a broader scope of the situation by mixing both approaches; therefore, the qualitative data (e.g. open-ended questions) would provide information on students’ perceptions and opinions about the CLIL experience and the quantitative results would present these results in a numerical fashion. Furthermore, some quantitative items were also implemented considering students’ engagement levels with the questionnaire as many open-ended questions (or other items in which students need to write) could lead to a lack of answers. This report of both qualitative and quantitative data is to be found in mixed methods research —“a combination of qualitative and quantitative methods within a single research project” (Dörnyei, 2007, p. 44)— which has been said to:

- Use the strengths of one method to overcome the weaknesses of the other (2007, p. 45).
- Provide a multilevel analysis of complex issues: both words and numbers are used in research (2007, p. 45).
- Improve validity: “convergence and corroboration of the findings” (2007, p. 45).

- Please a broader audience: by using two different methods, multiple audiences (qualitative and quantitative researchers) find acceptable the final results (2007, p. 46).

Overall, the flexibility in the data gathering is related to the qualitative methodology as this study aims to explore a specific CLIL classroom and its motivational components bearing in mind that “targeted focus-group work adds much to the baseline data, as it provides opportunities for exploring the reasons for both positive and negative attitudes in greater depth” (Coyle, Hood & Marsh, 2010, p. 137). It should also be accounted that “while a quantitative study is based on previous studies, a qualitative study is based primarily on itself [my translation]” (Hernández Sampieri, Ferández Collado & Baptista Lucio, 2010, p. 11). Therefore, the data used in this study and the conclusions reached after the analysis should not be understood as universal truths regarding CLIL and motivation but as an in-depth analysis of this CLIL section which contribute to the CLIL research corpus by providing a much needed first-hand CLIL classroom analysis.

## **5.2. Research Methods**

Although practical matters concerning the methodology of this study have already been explained, it is necessary to complete the aforementioned information with an overview of the research methods which have been used in order to understand the methodological implications and the theoretical background to the data collection process.

### *5.2.1. Classroom Action Research (CAR)*

The term Classroom Action Research (CAR) has its origins in Kurt Lewin’s (1946) conceptualisation of action research in which social practice plays a major role: “It is a type of action-research, a comparative research on the conditions and effects of various forms of

social action, and research leading to social action. Research that produces nothing but books will not suffice” (1946, p. 35). This definition caters to a practical approach to social situations by taking research to a real context where theoretical issues are considered though not the focal point.

In regards to educational practices, CAR takes this approach and “investigates human actions which are experienced by teachers, supervisors or administrators as unacceptable in some respects problematic, susceptible to change (contingent), and requiring practical response (prescriptive)” (Barsaga, 2001, p. 3). This leads to the conceptualisation of CAR as a problem-solving approach based on systematic observation, reflection and output which differ from formal research in some aspects: “CAR is more systematic and data-based than personal reflection, but it is more informal and personal than formal educational research” (Mettetal, 2001, p. 7).

The scope and the aim of this study promote a hands-on and practical-significant methodology. Regarding these matters, CAR provides for these traits in contrast to a more formal research approach:

Topic	Formal Research	Action Research
Goals	Generalizable knowledge	Context-focused knowledge
Sampling	Random or representative	Specific
Data analysis	Statistical	Focus on practical data
Application of results	Theoretical significance	Practical significance

Table 2: Formal Research and Action Research. Adapted from Barsaga (2001, pp. 2-3).

It is worth noting that there are some formal research issues which may be applied to the CAR methodology such as (1) a longitudinal framework, (2) researcher training and (3) literature review from previous cases. It is significant to salient that CAR has been criticised

by its modest scope and its reflection-based nature. Nevertheless, a CAR longitudinal approach to the issues at hand in the studied classroom may throw some light on the teaching practices which may influence the hypothetical issues to be studied.

Regarding researcher training, CAR is often described as “[t]rying to present some ideas for teachers beginning to enquire into what is happening in their classrooms whilst also making reference to different forms of action research and the place of teacher enquiry within education research” (Baumfield, Hall & Wall, 2008, p. 2). Therefore, it relies on the idea of the teacher as the researcher in the classroom and the creator of the enquiry. Concerning the reflection process in CAR, if the teacher takes the role of researcher, two types of reflection are considered: reflection-in-action (during the event) and reflection-on-action (away from the event) (Bamfield, Hall & Wall, 2013, p. 3). Nevertheless, CAR can be carried out by external examiners (such as in this study) which may be beneficial in order to separate the teacher and the researcher’s role from the study and the data.

Notwithstanding the type of researcher, Johnson (2012) draws ten descriptors concerning action research:

1. Action research is systematic: methodical and planned observation which goes beyond the simple description and reflection on the classroom situation.
2. You do not start with an answer: research should be unbiased so the answer could be found after the research has been carried out.
3. An action research study does not have to be complicated or elaborate to be rigorous or effective: a high level of specification in details may deter the study and its aims.
4. You must plan your study adequately before you begin to collect data: previous planning is necessary to present a systematic view rather than an impressionistic one.



5. Action research projects vary in length: the length of the study may depend on the type of study, its parameters and its aims as well as the data.
6. Observations should be regular, but not necessarily long: notwithstanding the length, observations should be systematic, pre-planned and consistent.
7. Action research projects exist on a continuum from simple and informal to detailed and very formal.
8. Action research is sometimes based on theory: it may be used to give context to the study as well as to draw comparisons with the gathered data and results.
9. Action research is not a quantitative study: action research is not a comparison between elements to state which one is the best; “the goal is simply to understand” (2012, p. 4).
10. The results of quantitative action research projects are limited: due to the modest scope of action research projects as well as their many unaccountable variables, results overgeneralisation to larger populations may not be advisable.

(Johnson, 2012, pp. 2-4)

Despite these descriptors, CAR has become widespread in the educational and academic realms. This has led to different uptakes on the definition of this methodology and the accounted variables. Nevertheless, the CAR process has been conceptualised into seven steps (Johnson, 2012; Mettetal, 2001; Mettetal, 2002):

1. Identify a question or a problem: deciding what to study based on a problem found in the classroom or a question which affects the classroom and the learning process. Mettetal (2002) states that the research question should follow three principles: (1) the question is significant to the classroom situation; (2) findings will lead to action and

change; and (3) the question should consider the feasibility of the project (e.g. time, resources, etc.).

2. Review literature: gathering background literature and data on the issue at hand to draw on the research done up to the moment.
3. Plan a research strategy: designing the research study may depend on aims, participants and contextual factors; therefore, this point is different in all CAR projects.
4. Gather data: collecting information may depend on the type of data (qualitative and/or quantitative) and the scope of the project. In order to provide validity, data triangulation should be considered (Mettetal, 2002).
5. Read and analyse data: looking for significant findings of a practical nature and looking for patterns.
6. Take action based on results: using CAR's findings to improve the actions taken in the classroom.
7. Share findings: in regards to teachers as researchers, this could be done informally (with other colleagues) or in a more formal setting (meetings, conferences, etc.). Concerning full-time researchers, findings are usually shared by means of publications.

Even though literature on CAR considers the figure of the teacher as a researcher reflecting on their practice, it is necessary to highlight that CAR is also carried out by full-time researchers. As previously mentioned, this may result in the implementation of some formal research elements in the action research in order to fill the gap left by the teacher's reflections (e.g. teacher's interview). This may lead to a refashioning or an extension to the concept of CAR.

### 5.2.2. *Conversation Analysis (CA) for Second Language Acquisition (SLA) and Content & Language Integrated Learning (CLIL)*

Conversation Analysis (CA) originated at the start of the 1960's following Sacks' studies on the organisation of social interaction and talk-in-interaction by means of analysing recordings of everyday conversations (Masats, 2017). This resulted in a new type of analysis of social conversations as daily-life dialogues were studied in terms of both verbal and non-verbal communication and new research tools (e.g. recorders) were introduced. In regards to CA origins, Markee (2000) states that “[i]nitially, CA researchers focused on describing the organizational structure of mundane, ordinary conversations, which may be defined as the kind of casual, social talk that routinely occurs between friends and acquaintances, either face-to-face or on the telephone” (2000, Ch. 2, par. 3).

From this first uptake, CA has evolved towards a more general consideration of the data to be studied: any type of interaction, informal (friendly conversation) and formal (classroom interaction), are studied under the CA label “inspired by fields such as pragmatics, speech act theory, the analysis of variation, interactional sociolinguistics, ethnomethodology, the ethnography of communication, communication theory and social psychology” (Masats, 2017, p. 322). This dual consideration of CA for formal and informal interaction has led to the term *talk-in-interaction* (Deppermann, 2000; Drew, Raymond & Weinberg, 2006).

According to Mori & Zuengler (2008), talk-in-interaction reflects on CA major issue:

CA considers that any speaker's talk at any moment should be viewed as a demonstration of the speaker's understanding of prior talk by the coparticipants, and simultaneously its delivery and design should be viewed as a reflection of the

speaker's orientation and sensitivity towards the particular coparticipants. (2008, p. 15)

Therefore, the social nature of interaction and its structured organisation are key points in the CA methodology and the research studies carried out within the field of sociology. Despite the methodological variety which can be found in different approaches to CA, four basic principles stand out (Seedhouse, 2004; Masats, 2017):

1. Interaction is a form of discourse with a clear order; the researchers' task lies in understanding its organisation. There is a rational organisation of interaction which should not be confused by rationality in the speech (Seedhouse, 2004, p. 14).
2. Interaction and context are linked so it is necessary to analyse it. Furthermore, interaction creates an observable context of its own "through the manner in which actions take place and how participants approach them" (Masats, 2017, p. 331).
3. Details such as silences, changes of intonation and rhythm are never insignificant and should be transcribed and considered. Nevertheless, Seedhouse (2004) admits that "[t]ranscripts are inevitably incomplete, selective renderings of the primary data which invariably involve a trade-off between readability and comprehensiveness" (2004, p. 15).
4. The analysis is to be drawn from the collected data and no previous theoretical assumptions should be made, thus, reflecting on the ethnomethodological principle of reflexivity (Seedhouse, 2004, p. 15).

In addition to this framework, CA research needs to consider some pragmatic issues which influence the research process such as the choice of a system to represent the observable phenomena (Masats, 2017). Transcripts are the systematic and theorised collected data taken from the interaction process; however, these are partial and selective as they restrict the social

reality to be studied (2017, p. 329). The process of ‘reconstruction’ of the gathered data through transcripts relies on a process of selection (decision on the aspects which should be visualised taking into account the goals of the study) and simplification (abstract aspects are pragmatically read) (Ochs, 1979, p. 44). Furthermore, some considerations on the choice of a transcription system based on the aims of the study should be given, though no consensus has been reached on transcript conventions (Masats, 2017).

Despite the differences in CA methods, Seedhouse (2004, pp. 40-42) points out some procedures to follow when using a CA uptake in research:

1. Uncover an action sequence or sequences.
2. Describe the actions in the sequence or sequences: “The idea of characterizing the actions in the sequence may be termed form-function matching, speech act analysis, or discourse analysis (DA)” (2004, p. 40).
3. Study the action sequences in regards to organisation of turn taking.
4. Study the action sequence in regards to sequence organisation.
5. Study the action sequence in regards to repair organisation.
6. Study how the speakers “package their actions in terms of the actual linguistic forms which they select from the alternatives available and consider the significance of these” (2004, p. 41).
7. Discover any roles, identities or relationships which result from the interaction.
8. Try to locate the previous results within the bigger picture.

CA’s uptake as an interactive-based methodology has made CA and talk-in-interaction a popular research method in classroom action research. These first CA classroom studies focused on the teacher’s instructional talk in regards to their organisational structures (different from ordinary conversation) (Mori & Zuengler, 2008, p. 17). In regards to SLA

(CA-for-SLA), some debate has been carried out on whether CA is a suitable methodology for SLA studies (Markee, 2000; Masats, 2017; Mori & Zuengler, 2008) based on three main objections: (1) SLA is a cognitive based discipline while CA is focused on a behavioural uptake of interaction; (2) CA accounts for language use, not language acquisition; and (3) turn-based interaction is not an appropriate unit of analysis for SLA.

Nevertheless, the newfound interest in the social reality of the classroom and the sociolinguistic nature of the SLA classroom encourage the use of CA as:

CA-for-SLA draws on an emic standpoint in its accounts of how teachers and students in the L2 classroom make use of the target language in order to participate in interaction and accomplish situated social practices in which they simultaneously orient to the rules of such practices, appropriate linguistic norms and mutual organization of actions. (Evnitskaya, 2012, p. 89)

This social and interactive focused approach allows for a study on the social dimension of the FL classroom as well as a study of the structural organisation of speech in FL learners. Taking into account the linguistic constraints learners may have by using a non-native language, issues such as communication breakdowns and repair processes need to be considered in SLA: CA may throw some light in these elements as “[CA] are just as interested in the mechanisms of turn construction, which could be verbal or non-verbal, as they are in the mechanisms speakers adopt for turn taking” (Masats, 2017, p. 335).

In regards to CA-for-CLIL, some elements of CA-for-SLA could be introduced such as the study of turn-taking, interaction, repair processes and communication breakdowns. However, other issues only pertaining CLIL should be considered. Taking into account the dual nature of CLIL (content and language), CA may help reflect on the different academic language functions described by Dalton-Puffer (2007): thanks to CA, these language

functions could be contextualised within the interactional patterns in order to study the structures in CLIL interaction.

For this study, CA has been used as a secondary methodology in order to study the systematic classroom observation transcripts. The purpose behind this is to use CA to determine how and when CLIL students interact using the language of instruction. The aim behind the choice of this methodology is to reflect on their language use as an element to consider in the study of motivation. These results are conceptualised within the interactive-based nature of CA by referencing the teacher/students interaction as well as student/student interaction.

### **5.3. Research Tools & Data Gathering**

The design of the research tools has been marked by changes in the methodology after the pilot observation of the classroom. It is necessary to highlight that the number of participants and the physical environment of the classroom have influenced the data gathering process as well as the research tools. Having considered these elements, three main tools were used in this study: students' questionnaires, teacher's interview and systematic classroom observation. These tools were implemented not only to acquire pertinent information to the study, but also to avoid any bias or possible misreading of the data; thus, the triangulation of the data by means of the different tools provides a broader overview of the classroom environment and the analysis of the results.

#### *5.3.1. Students' Questionnaires*

The questionnaires (see Appendix D: Chapter 5) were given during the 'tutoría' hour for each group in order not to use one period of the Physics subject (parents were informed about this questionnaire by means of a letter). Apart from practical reasons (e.g. timing), the

decision to carry out the testing during ‘tutoría’ was based on the fact that students may feel less ‘observed’ if the CLIL teacher was not present and would feel free to write down their perceptions on their CLIL experience. As motivation is an issue which deals with the “*internal psychological state that accounts for the initiation, direction and maintenance of behaviour*” (Towsend, 2010, p. 120) and it fluctuates over time (Dörnyei & Ushioda, 2011), the timing was an important element to consider. Therefore, the ‘tutoría’ hour was chosen as the moment to hand in the questionnaires because students feel comfortable as it is a non-assessed subject and the environment is more relaxing. In regards to questionnaire timing, the questionnaire was designed to take around 20 minutes; this was done after having considering students’ attention span and the reliability of their answers; the researcher considered that a longer questionnaire would make students lose interest and not pay attention to the task at hand, thus, making the results unreliable. In order to analyse these results, the *Statistical Package for Social Science* (SPSS) software is used.

Concerning the topic of the study, no mentions of motivation were given when explaining the questionnaire nor in the questions students had to answer; the word ‘motivation’ can only be found in the questionnaire’s heading. The purpose behind this decision was to avoid any type of influence in students’ answers in regards to what they consider motivation; it would have been possible that the results could have been influenced by their perception of motivation (most likely ‘external’ motivation).

In regards to the language used in the questionnaire, it was decided that Spanish would be used as the language to write this tool. This choice was taken for two main reasons: (1) students may find easier to answer in their L1 and there would be no place for language-based incomprehension. (2) As the main language in students’ repertoire, the L1 is used for most thinking skills: as the questionnaire has a strong reflection-based nature, it would only be natural for students to reflect on the bilingual section using the L1. Furthermore, it should



be accounted that the purpose of this study is not to deal with the students' FL level as much as their motivation when using said language. Therefore, there was no specific need to write the questionnaire in English as language assessment is not part of the study.

Moreover, the type of language used in this tool was also considered as an element which may influence students' attitude. As Canals (2017) points out "[questions] should also be posed in a non-intrusive way so participants do not get the feeling we are judging their lifestyle, beliefs about different languages or linguistic behaviour" (2017, p. 398). Therefore, the language used in the questionnaire has endeavoured to bear in mind any possible issues which may make the participants feel judged. In order to do so, questions such as their perception of their English skills were presented with different choices so students would be able to pick the options which suited them.

Different types of questions/items were used in the questionnaire so to gather specific information on the participants. The diversity within the questionnaires is due to two main reasons: (1) using different types of questions would avoid students' 'boredom' (they would be 'obliged' to read the questions and answer accordingly instead of ticking a box or choosing a number randomly); and (2) different types of questions were necessary depending on the information that needed to be elicited. Therefore, different items are used:

- Multiple choice questions: in order to provide a broader scope of possibilities, multiple choice items were given to questions in which students may differ the most due to their 'individual' nature (e.g. parents' level of English).
- Closed-ended questions: information such as students' age was gathered by using this type of questions.
- Semi-closed/open-ended questions: in order not to 'judge' or take for granted information regarding language use and students' perceptions, some questions such as

the language spoken at home were not directed (no multiple choice). This allowed students to write down the language(s) they spoke at home.

- Open-ended questions: the aim of this type of questions was to gather information on students' perceptions regarding the bilingual section (e.g. concerns about the section).
- Yes/no questions: in order to avoid potential indecision in students' answers, some yes/no questions were used (e.g. 'would you have chosen the bilingual section if it were optional?').
- True/false items: only one true/false statement was used concerning students' use of other materials apart from the textbook. This item was written as a T/F because the use of non-textbook materials is quite necessary to pass the exams. If students were to answer 'false', this could be read in motivational and well as pedagogical terms.
- Lickert scale items: students have to answer to positive-written statements (e.g. 'Physics in English makes me improve my English') by choosing a number from 1 (yes) to 5 (no). The different numbers provided would allow for a broader data analysis.
- Table: students were asked to complete a table marking 'x' regarding their perceived level of proficiency in the four skills and introduce percentages regarding their perception of English/Spanish use in the classroom. These tables were used not only to gather information, but also to change the format of the questionnaire so student would not find it very repetitive.

In order to gather specific information from the questionnaire in a structurally cohesive way, the items were divided according to Spradley's (1980) social dimensions of observation. The dimensions used in the questionnaire are:

1. Actors: personal data on the participants was necessary to draw a background context as “all kinds of other information such as age, educational level, family situation, country of origin, place of residence, school attended and many other additional details might be relevant when it comes to data analysis” (Canals, 2017, p. 398). In this category, the participants were asked language-related questions to understand their linguistic background.
2. Feelings: as one of the main key points of this study, feelings and students’ reflection on the bilingual section were dealt with in this dimension by means of closed-ended and open-ended questions among other types of items.
3. Activities: classroom practice and other issues regarding this were considered in this dimension. These items were focused on language issues such as percentages of language use (perception) and use of English in classroom activities.
4. Goals: these items were focused on finding out students’ expectations towards English learning in Physics for their future (e.g. job prospects) as well as an overall reflection on the advantages and disadvantages of the bilingual section.

### 5.3.2. *Teacher’s Interview*

The teacher’s interview was carried out after the classroom observation was finished and students’ questionnaires were collected. The decision of leaving the teacher’s interview as the last information gathering element was based on the fact that research needs continuous reflection and it “will only work out well if researchers are flexible, resourceful and ready to make quick changes to the plan if necessary” (Moore & Llompart, 2017, p. 414). Therefore, the interview items are the result of a reflection process after considering the classroom observation as well as a rough analysis of the questionnaire’s results. Furthermore, the results from the ‘pilot’ interview (before the classroom observation) and the informal conversations with the teacher (during the classroom observation) were considered to define

the items of the interview along with the objectives of the study. In order to do so, a structured interview was carried out: “when making this type of interviews it is important to control the environment’s influence [my translation]” (Gil Pascual, 2016, p. 204).

The main purpose behind the teacher’s interview was to systematise the teacher’s perceptions and opinions on CLIL and the bilingual section. Furthermore, the interview format allowed for the teacher to reflect on the teaching experience in terms of theoretical and legal issues as well as his classroom practice. It is necessary to highlight the importance of the teacher’s views and perceptions as a main influencing element in CLIL specifically and in the classroom in general as “teacher expectations have effects on students’ achievement” (Rubie-Davies & Peterson, 2010, p. 134) and their motivation: “teachers’ motivation plays an important role in the process of language learning. Motivated teachers will use more motivating strategies in class, and that will influence directly students’ motivation and achievement” (Prieto Arratibel & Bueno-Alastuey, 2015, p. 48).

Although teacher’s questionnaires are more common in Ph. D dissertations (Gené Gil, 2010; Vallbona González, 2014), it was decided that teacher’s interview would be a preferable model to gather data in this study for several reasons:

1. Personal interview allows for an instant rephrasing of the questions in case these are not understood by the interviewee.
2. The interviewee’s answers are not constrained by physical space as it happens with a questionnaire; therefore, a more ‘complete’ answer could be provided.
3. The interactive nature of an interview brings the items/questions into a multidimensional environment in which they become meaningful.

The interview was conducted in the usual classroom and English was the language used by interviewer and interviewee. The reason behind the use of English in the interview is due to

the fact that English is the language of instruction the teacher is used to; therefore, reflection on his opinion about CLIL and classroom practice would be more natural in the language of instruction.

In regards to the items on the interview (34 questions), these were divided into three groups according to the topic:

1. Teaching formation: this section includes questions to elicit information on the teacher's profile both content and language wise. Issues such as the teacher's professional experience in CLIL were dealt with as these are significant elements concerning teacher's motivation and pedagogical perceptions (Infante, Benvenuto & Lastrucci, 2009). Furthermore, questions concerning refresh courses and CLIL training give a glimpse on the teacher's commitment to the CLIL method.
2. Opinion on CLIL: the teacher was asked to give his opinion on several CLIL issues such as legislation, CLIL teacher's training and attitudes, current challenges in CLIL in Spain, institutional support, advantages and disadvantages in CLIL, motivation issues and the effectiveness of CLIL. This section was the longest one as the teacher's reflection on CLIL is a focal point of this study.
3. Classroom practice: practical issues regarding CLIL and classroom practice such as materials adaptation and language use are considered in order to understand the teaching practice in context. Furthermore, some questions such as percentages of language use were also introduced in students' questionnaire so a comparison on teacher's and students' perceptions could be drawn.

Overall, the teacher's interview provides more data on the CLIL context as well as the teacher's own predisposition towards this methodology. The importance of teachers' expectations and beliefs needs to be considered in regards to affectivity as well as the

pedagogical connotations this involves: “When teachers have high expectations for students, they introduce more concepts within each lesson, teach them at a faster pace and include more challenging learning activities [...] The opposite occurs for low expectation students” (Rubie-Davies & Peterson, 2010, p. 134). Therefore, the teacher’s interview reveals significant elements concerning the CLIL experience.

### 5.3.3. *Systematic Classroom Observation*

The observation of the classes considered in this study was carried out for the duration of a didactic unit, particularly the didactic unit titled *Dissolutions* (Unit 19 in the textbook; Bernstein, Schachter, Winkler & Wolfe, 1998). These observations lasted for a period of more than a month (March/April 2017; February 2018) in which theoretical and practical lessons as well as laboratory practice were performed. Due to the overall qualitative nature of this study and the use of data dealing with students’ perceptions (e.g. questionnaires), classroom observation was necessary to analyse the data from an outsider’s perspective (the researcher) with no previous misconceptions of the classroom practice.

In order to disturb the least the natural classroom practice, the only acknowledgement to the researcher’s task was the CLIL teacher’s introduction the first day of the ‘pilot’ observation (December 2016) without stating the aim (research on CLIL and motivation). During the observation, the researcher sat at the end of the class out of students’ sight so students would not feel observed and preserve the usual classroom environment as the aim behind this observation was to study natural classroom interaction in regards to language use.

Some challenges were found concerning the data gathering process during the pilot observation. Firstly, video recording is forbidden by law in classrooms where minors are present (DOGA, 1997); therefore, using a video recorder was not possible. Furthermore, the dimensions of the classroom and the number of students made impossible to use voice

recorders as these did not record all the voiced interactions in the classroom, especially the students' speech. Hence, it was decided that 'instant' transcription would be carried out by the researcher following Mack, Woodson, MacQueen, Guest & Namey's (2005) guidelines on field study.

As the process of qualitative data gathering starts before the actual gathering process, the notes and the classroom observation transcripts were taken following a systematic process which bore in mind the aims of the study. This led to a careful planning on the type of gathered information also considering the constraints of the study; for instance, the lack of video recording made impossible to collect information on facial expressions. Furthermore the process of transcription was divided into two stages (Moore & Llompart, 2017):

1. Rough transcription: transcription in action; the teacher's and students' speech were recorded in written form as well as other relevant pieces of information (e.g. laughter, pauses, body language, etc.).
2. Fine transcription: the previous transcription is filled with more detail and expanded to reflect on the classroom environment. This type of transcription was done right after the each classroom observation session took place (during 'free' periods between sessions) so to avoid any possible misunderstanding on the data reading and to fill any voids in the previous transcript.

It should be considered that the choice of data done throughout this process is related to the purpose of the study: according to Moore & Llompart (2017) "if doing a multimodal transcription, it is not necessary to transcribe absolutely everything that the participants do (i.e. absolutely every micro eye or hand movement), only what seems to be relevant for the ongoing interaction to proceed and for the research" (2017, p. 412). Therefore, the transcription excerpts used in the data analysis have been chosen due to their overall value

regarding the aims of the research and the research questions in order to throw some light on the real classroom environment.

#### **5.4. Background Context**

The study has been influenced by the background context of the participants in terms of educational, social and economic context. These phenomena need to be considered during the before-during-after data gathering process. It has been well established that socioeconomic factors influence foreign language learning (Yazigi, 1991; López Montero, Quesada Chaves & Salas Alvarado, 2014) and motivation (Gayton, 2010; Attamimi & Rahim, 2011; Kormos & Kiddle, 2013). Therefore, some issues regarding the background context for this study need to be taken into account.

##### *City Area*

The high-school from this study is set in a city of less than 250 000 inhabitants, one of the largest cities in the autonomous community. As the major city of the area and centre of touristic attractions, the city has an eclectic cultural offer (e.g. cinemas, museums, opera, theatres, coliseum, etc.). However, there are some differences between suburbs. The suburb where this centre is located was built in the 1980's in order to avoid residential decentralisation from the city to other nearby towns; therefore, the buildings are fairly new. The residential area is located in close proximity to the sea and the most important monument in the city, a touristic landmark which attracts many tourists to the area.

Concerning the demographical profile of the city, it should be accounted the cultural and ethnic diversity within the city and some specific suburbs. Furthermore, the fact that there is a university in the city brings young population to the area as well as international students. The area where the study takes place is an increasing demographic suburb with an



average number of young people (compared to the city average) and not much cultural and ethnic diversity.

### *High-school*

Founded in 1991, the educational centre is situated in the northernmost area of the suburb close to the seaside and touristic attractions. The number of students during the academic years 2016/2017 and 2017/2018 were more than 400 students. This centre offers different academic choices:

- Secondary Education
- Upper-secondary Education
  - Arts
  - Humanities and Social Sciences
  - Natural and Technological Sciences

In regards to their linguistic policies, this centre fall under the category of a plurilingual centre as bilingual sections are implemented in all academic levels being the language of instruction for these sections English. The subjects imparted following this methodology are: Natural Sciences (1<sup>st</sup> ESO), Physics (2<sup>nd</sup> & 3<sup>rd</sup> ESO), IT (4<sup>th</sup> ESO) and Volume (1<sup>st</sup> Bach; Arts). In regards to the classrooms used, Physics and Chemistry (as well as other subjects) has a specific classroom space (see Figure 17, Appendix D: Chapter 5) so students have to change classrooms in order to attend different subjects.

The centre has a relatively long trajectory of CLIL implementation dating back from 2006/2007 where the first section was implemented in 2<sup>nd</sup> ESO Natural Sciences. Since then the academic offer regarding CLIL sections has expanded to all academic levels. A high level of commitment regarding bilingual sections and language proficiency is found in different

spheres, for instance, English is promoted by the ANPA (Parents' Association) by means of an extracurricular English Club. Apart from English, other languages are promoted such as German and French (optional subjects) and Galician (the school magazine is presented within the Galician promoting plan).

### *Participants*

The participants of this study were 2<sup>nd</sup> ESO students in the bilingual section (Physics) and their teacher during the academic years 2016/2017 and 2017/2018. It should also be accounted that the academic course 2016/2017 was the first time Physics was taught in 2<sup>nd</sup> ESO. However, students had already been part of the bilingual section the previous year (1<sup>st</sup> ESO; Natural Sciences). It should also be accounted that some students (N=3) were part of bilingual sections in primary education in a state financed school. Furthermore, some cultural diversity was found in the three classes which were observed –two in the first year and one in the second year due to the low number of students in 2<sup>o</sup> ESO in 2017/2018–, though there was not a significant amount so it has not been studied in detail. In sociolinguistic terms, the majority of students have Spanish as their L1 with many few of them mentioning Galician (or Galician and Spanish) as their L1 (see Chapter 6.1.1). Concerning the number of students per classroom, the following categorisation needs to be made:

- Group A (2016/2017): 18 students; 12 female and 6 male.
- Group B (2016/2017): 22 students; 9 female and 13 male.
- Group C (2017/2018): 21 students; 8 female and 13 male.

Although the total number of students enrolled in the bilingual sections during these two years is 61, the number of students who partook in filling the questionnaire is lower as some did not attend that day (N=53). Nevertheless, this is a small number compared to the final figure.

The Physics teacher is also considered a participant and key component of the study. Furthermore, he is one of the common elements to the participants due to his position of CLIL Physics teacher in 2<sup>nd</sup> ESO during the two years the data collection was carried out. It is also worth mentioning his position as the Physics coordinator and his long experience implementing the CLIL sections in this specific high-school as well as in others. In addition, it should be pointed out that part of his teaching career was done in Canada and he has a high level of English.



## **CHAPTER 6: DATA ANALYSIS**

This chapter presents the gathered data in regards to classroom practice during the two academic years where this study was carried out. Therefore, significant data is presented in terms of students' and teacher's attitudes as well as classroom dynamics. These help to achieve the second aim of this doctoral dissertation (to study motivation in a Galician CLIL section) and to answer the research questions drawn for this study. It should be considered that in a mixed methods report (qualitative and quantitative) "we need to use both words and numbers to support our interpretations, and although these do not exclude each other, to present them in a convincing manner and to justify the meaning inferred from them requires a different framing and formatting approach" (Dörnyei, 2007, p. 300). This is to be done by providing visual and number-based materials (e.g. table of figures) as well as expanding these with text-based explanations in order to reach an in-depth analysis and data discussion. This inquiry is focused on three subheadings which are linked to the data gathering tools: students' questionnaires (6.1), teacher's interview (6.2) and systematic classroom observation (6.3).

### **6.1. Students' Questionnaire**

Students' questionnaire is the main quantitative tool used in this study. Taking into account that "the essence of scientific research is trying to find answers to questions in a systematic and disciplined manner" (Dörnyei, 2007, p. 101), the information gathered in this questionnaire follows a structured pattern with different items (see Chapter 5.3.1) in order to come up with reliable quantitative (and some qualitative) data. The purpose behind the use of the questionnaire is to gather information on (1) students' personal background (e.g. MT, language certificates), (2) their feelings towards the CLIL section (e.g. level of satisfaction, perceived difficulties), (3) their experience in the CLIL lesson (e.g. language use, materials) and (4) their thoughts on the importance of English and the CLIL section (e.g. job opportunities, advantages and disadvantages of the CLIL section).

Due to the individual nature of the questionnaires, the information gathered is related to the ‘individual self’ in contrast to the ‘social self’ (Csizer & Dörnyei, 2005) which is analysed in the systematic classroom observation (see Chapter 6.3). This allows for an in-depth analysis of students’ perceptions bearing in mind their IDs (individual differences; Dörnyei, 2009b). The information is to be analysed by means of graphs, tables of figures and textual comments following the structure present in the questionnaire:

- 1) Actors
- 2) Feelings
- 3) Activities
- 4) Goals

Firstly, the number of students who took the questionnaire and well as the number of students of each group (Group A, B or C) should be accounted so to understand the results and the percentages in the different group contexts:

		Studied Groups			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Group A	17	32,1	32,1	32,1
	Group B	17	32,1	32,1	64,2
	Group C	19	35,8	35,8	100,0
	Total	53	100,0	100,0	

Table 3: Studied Groups.

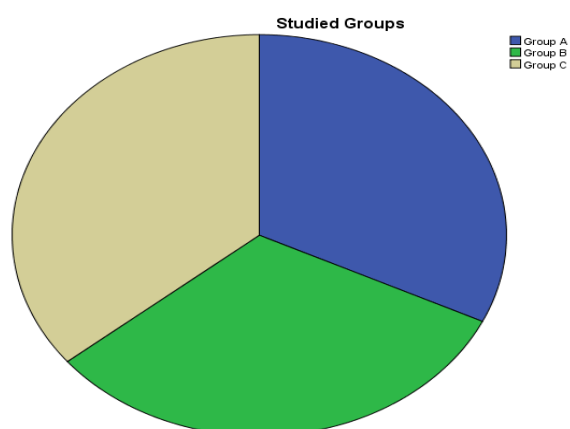


Figure 18: Studied Groups.

As it can be appreciated, the percentage of students from Group C (35,8%) is slightly higher than in Group A and B (32,1% each), though the difference is not significant enough which may cater to any type of consideration in contrast to the other two groups. Therefore, it could be argued that the three groups are somewhat homogeneous in terms of participants.

In order to answer the research questions (see Chapter 7.1), the data is to be analysed following the structure and items of the questionnaire: the four aforementioned divisions taken from Spradley's (1980) social dimensions of observation (actors, feelings, activities and goals) are to be accounted as well as their corresponding questionnaire items.

### **6.1.1. Actors**

The main aim of this section is to provide an overall background on students' profiles in terms of gender, age, MT, foreign language knowledge, previous CLIL background, parental involvement and non-academic use of English among some other factors which may have a direct influence in students' motivation and perception of the CLIL phenomenon.

#### *Participants' Age*

In terms of age, the studied groups are in 2° ESO, that is, second year of secondary education. Therefore, their age group is between 13 and 14 years. As seen on the graph below, more than half the participants are 13 years old (56,6%; 61,2% as valid percent) while 34,0% (36,7% as valid percent) are 14 years old. Furthermore, only one participant (1,9%; 2% as valid percent) deviates from the age average due to the fact of being a repeat student. The fact that most students are on their corresponding academic level may lead to consider that their overall academic achievement is satisfactory, though this could not be ascertained for sure as some of the 14 year-old participants may be repeat students as well (the questionnaire was completed in the first trimester of the year).

		Age			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	13	30	56,6	61,2	61,2
	14	18	34,0	36,7	98,0
	15	1	1,9	2,0	100,0
	Total	49	92,5	100,0	
Missing	System	4	7,5		
Total		53	100,0		

Table 4: Participants' Age.

### *Gender*

Studies on CLIL performance by gender in Galicia have been carried out (San Isidro, 2010) with no significant difference on the results. Although the aims and research questions of this study do not specify in regards to gender issues, it is important to mention the questionnaire takers' gender so to provide a broader contextualisation of the participants. Overall, the percentage of men and women who took the questionnaire is somewhat homogeneous (men: 52,8%; women: 47,2%).

		Gender			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Man	28	52,8	52,8	52,8
	Woman	25	47,2	47,2	100,0
	Total	53	100,0	100,0	

Table 5: Participants' Gender.

However, it is necessary to take a closer look to these results bearing in mind the gender ratio in the three studied groups. As seen on the table and graph below, there are some significant differences concerning the gender rate in the groups: while the data gathered from Group B and C is mostly from male participants (N=11), Group A differs from this tendency and the number of female students who took the test is higher (N=11) than their male counterparts in their group (N=6). Therefore, although the percentages of men and women who took the questionnaire are quite homogeneous (52,8% and 47,2% respectively), a closer



analysis on the participants' gender per group shows that there are significant gender differences (in numerical terms) within the groups.

		Studied Groups		
		Group A Count	Group B Count	Group C Count
Gender	Man	6	11	11
	Woman	11	6	8

Table 5.1: Participants' Gender (Groups).

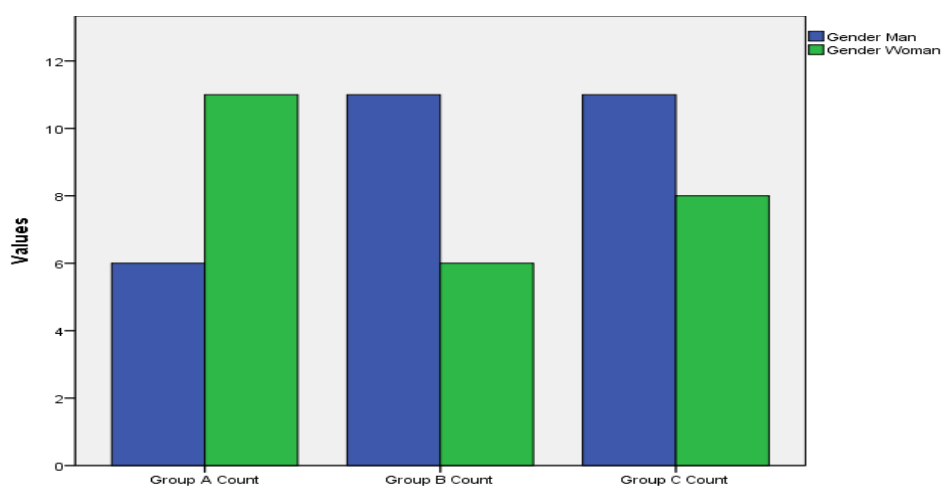


Figure 19: Students Divided by Group and Gender.

### *Languages Spoken at Home*

Although Galicia is an official bilingual community, the state of Galician has been a matter of concern in the last decades, especially among the younger generations (see Chapter 3.1). Having discussed the metacognitive and metalinguistic advantages of bilingualism (see Chapter 4.2), it is important to consider the students' language use at home.

Languages Spoken at Home					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Spanish	40	75,5	75,5	75,5
	Galician	4	7,5	7,5	83,0
	Spanish and Galician	6	11,3	11,3	94,3
	Spanish and other language	3	5,7	5,7	100,0
	Total	53	100,0	100,0	

Table 6: Languages Spoken at Home.

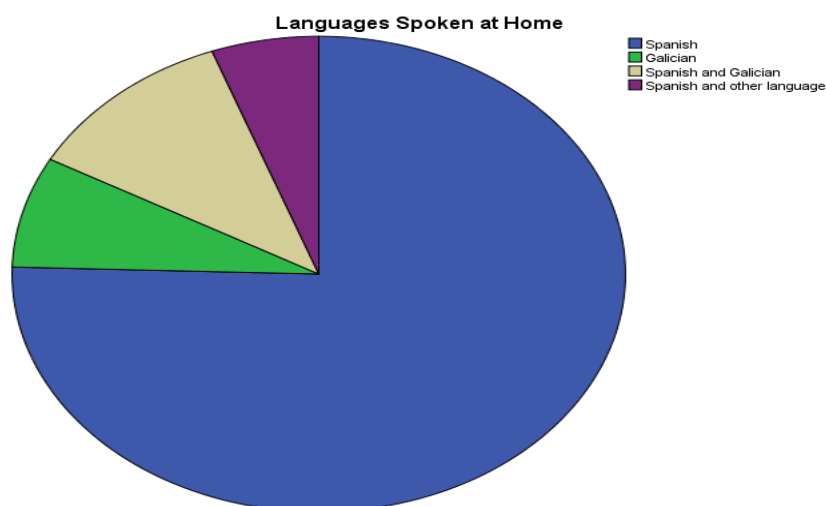


Figure 20: Languages Spoken at Home.

As it can be appreciated, most participants (75,5%) stated the only language they used at home was Spanish: this result was not surprising after observing students during the classroom observation and bearing in mind the linguistic panorama of the city where this study was carried out (high number of Spanish speakers). However, a modest number of students speak Galician at home (7,5%: N=4) and 11,3% of them speak both Galician and Spanish (N=6). Furthermore, a small number of students (5,7%: N=3) speak Spanish and other language (Catalan, German and English) at home. Therefore, the total percentage of students who use two languages at home is 13,2% (N=7). This may lead to conclude that the percent of ‘active bilinguals’ is low, though the number of ‘passive bilinguals’ (native-like understanding of two languages but use of only one) is certainly higher.

#### *First Contact with English (Age)*

Scholars have pointed out the advantages of learning a foreign language at an early age due to the cognitive advantages of these first stages (Navarro, 2009; Ruiz Calatrava, 2009). Even though there is no consensus on whether a critical period to learn a FL exists as it does for a L1 (see Chapter 4.2), it seems children who are in early contact with a FL achieve better results in said FL. This first contact could occur in early private lessons or when in mandatory schooling; for instance, foreign language is introduced in the second

cycle of Early Stages (*Decreto 330/2009*) and the *Edulingüe 2020* project endeavours to implement CLIL sections as early as kindergarten in Galicia.

This has led to an early contact with the foreign language (usually English) in the last years. However, the participants for this study would not have benefited from the aforementioned projects as their kindergarten education (non-mandatory) took place before these projects were implemented, though the educational law at that moment (LOE, 2006) stated as an objective of the second cycle to initiate students in a foreign language (2006, p. 17162). Therefore, it was necessary to ask the participants' age when they first had contact with the foreign language:

		First Contact with English (Age)			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	0	1	1,9	1,9	1,9
	2	1	1,9	1,9	3,8
	3	23	43,4	44,2	48,1
	4	9	17,0	17,3	65,4
	5	8	15,1	15,4	80,8
	6	7	13,2	13,5	94,2
	7	3	5,7	5,8	100,0
	Total	52	98,1	100,0	
Missing	System	1	1,9		
Total		53	100,0		

Table 7: First Contact with English (Age).

Almost half the participants (43,4%; 44,2% as valid percent) stated they had started learning English when they were 3 years old. This could be related to the fact that they started the second cycle of kindergarten at that age, thus, being in contact with the FL. However, private lessons could have been another option to explain this issue.

### *Language Certificates*

As it was previously mentioned, the acquisition of language certificates has risen exponentially in the last years (Tabuenca-Cuevas, 2016). Nevertheless, the acquisition of a

language certificate might not be explicitly related to language proficiency or be proof of intrinsic motivation, but it is one way to measure extrinsic motivation understanding the acquisition of a language certificate as “the performance of an activity in order to attain some separable outcome” (Deci & Ryan, 2000, p. 71). In regards to the participants of the study, only 5,7% (5,8% as valid percent) responded affirmatively at having a language certificate; 2 participants from Group A and 1 participant from Group B. In regards to the type of certificate, only one participant from Group A specified his language certificate (EOI Beginner’s Level) and the sole participant from Group B (Cambridge First Certificate). Due to the small figure, no overall conclusion can be reached in regards to language certificates and extrinsic motivation.

		Language Certificates			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	No	49	92,5	94,2	94,2
	Yes	3	5,7	5,8	100,0
	Total	52	98,1	100,0	
Missing	System	1	1,9		
Total		53	100,0		

Table 8: Language Certificates.

### *Experience in an English Speaking Country*

As explained in Chapter 4.1, Gardner and Lambert’s (1972) conceptualisation of integrative and instrumental motivation classifies the desire of ‘integration’ with the target culture within the integrative motivation category, while instrumental motivation is based on pragmatic positive regard to the L2 (e.g. learning the FL so to have better job prospects). However, this classification was further specified later by Kruidenier & Clement (1986) who stated four other orientations within instrumental orientation, one of these being ‘travel’. Bearing in mind that close contact with the target culture would have an impact on students’

motivation, their experience in an English speaking country was asked by means of a multiple choice item:

### Experience in an English-Speaking Country

		Studied Groups			Total	
		Group A	Group B	Group C		
Experience in an English-Speaking Country	Visiting with family	Count	4	3	1	8
		% within Studied Groups	23,5%	17,6%	5,3%	15,1%
	Visiting with peers	Count	2	0	3	5
		% within Studied Groups	11,8%	0,0%	15,8%	9,4%
	Never been to an English-speaking country	Count	10	14	15	39
		% within Studied Groups	58,8%	82,4%	78,9%	73,6%
	More than one of the previous options	Count	1	0	0	1
		% within Studied Groups	5,9%	0,0%	0,0%	1,9%
	Total	Count	17	17	19	53
		% within Studied Groups	100,0%	100,0%	100,0%	100,0%

Table 9: Experience in an English-Speaking Country.

Overall, the highest percentage in the three groups is found in the ‘Never been to an English-speaking country’ category (Group A: 58,8%; Group B: 82,4%; Group C: 78,9%). Moreover, it is also significant that Group B is the group with the highest percentage in this category. Concerning participants who have been to English-speaking countries, Group A is the group with most students visiting these countries (23,5%, visiting with parents; 11,8% visiting with peers), followed by Group C (5,3%, visiting with parents; 15,8% visiting with peers) and, lastly, Group B (17,6% visiting with parents).

Taking into account that instrumental orientation has more weight in L2 learners who are not close in space and attitude to the target culture (Oxford, 1996) and that integrative motivation is to be found in L2 learners who were able to interact with the target culture (Clement, Dörnyei & Noels, 1994; Dörnyei, 1990; Oxford, 1996), it could be hypothesised

that the data gathered in this question points out to a possible integrative orientation towards the L2 in Group A and C and a possible instrumental orientation towards Group B, though this needs to be further examined using the information from other items and the other research tools.

### *Other Foreign Languages*

Although the focus of this study is on the English language and motivation in the CLIL classroom, it is necessary to be aware of whether the participants of the study are in contact or studying other foreign languages to consider whether the educational laws which encourage foreign language proficiency in at least two languages (e.g. LOMCE) are being implemented. As seen in the graph and table below, it can be appreciated that the great majority of participants study other foreign language apart from English with French being the preferred option (64,2%) followed by German (20,8%). Other languages were also mentioned to a lesser extent (1,9%) and some pointed out they know more than one foreign language apart from English (7,5%). Furthermore, although a small percentage of participants stated they did not know any other FL (5,7%), the data gathered may lead to conclude that the vast majority of students know at least two FL; thus, it could be said the studied groups follow the foreign language-based directions from the European Council in regards to the number of foreign languages a student should know.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No other languages	3	5,7	5,7	5,7
	German	11	20,8	20,8	26,4
	French	34	64,2	64,2	90,6
	Other	1	1,9	1,9	92,5
	More than one	4	7,5	7,5	100,0
	Total	53	100,0	100,0	

Table 10: Other Foreign Languages.

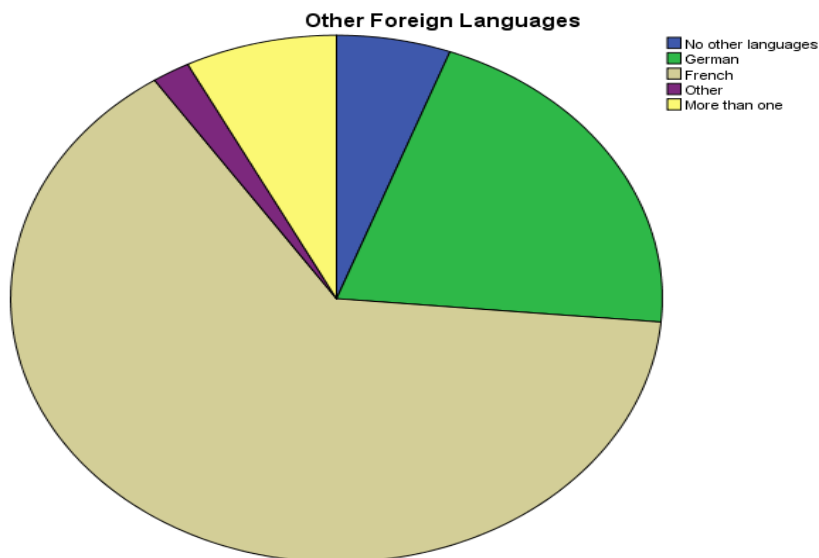


Figure 21: Other Foreign Languages.

### *CLIL in Primary Education*

Continuity is one of the main factors which may prove whether an educational change has served its aims and purposes; pilot projects and their posterior implementation can only give so much information. As it has been pointed out, CLIL has risen exponentially in the last years in both mandatory and non-mandatory schooling. Therefore, new wholly CLIL generations (students who had participated in the bilingual sections during all their mandatory schooling) have appeared in the last academic years. As it has been proved, CLIL students' perceptions change over time depending on the scope of time they had belonged to the bilingual sections (San Isidro, 2017). Bearing in mind that motivations and perceptions are issues which fluctuate throughout time, previous CLIL experiences need to be considered in this study. As the participants of this study belong to a plurilingual high-school, it is a known fact they have belonged to a CLIL section in the previous year (1° ESO: Science). However, a longer diachronic perspective needs to be taken. In order to do so, students were asked whether they had belonged to a CLIL section in Primary Education. The results indicate that only 5,7% (N=3) of the participants who completed the questionnaire took part in a CLIL

group in Primary Education in contrast to the remaining 94,3% who did not participate in CLIL previous to their high-school experience.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	50	94,3	94,3	94,3
	Yes	3	5,7	5,7	100,0
	Total	53	100,0	100,0	

Table 11: CLIL in Primary Education.

In regards to the students who answered affirmatively to having a CLIL subject in Primary Education, not much variation could be found in regards to the CLIL subjects:

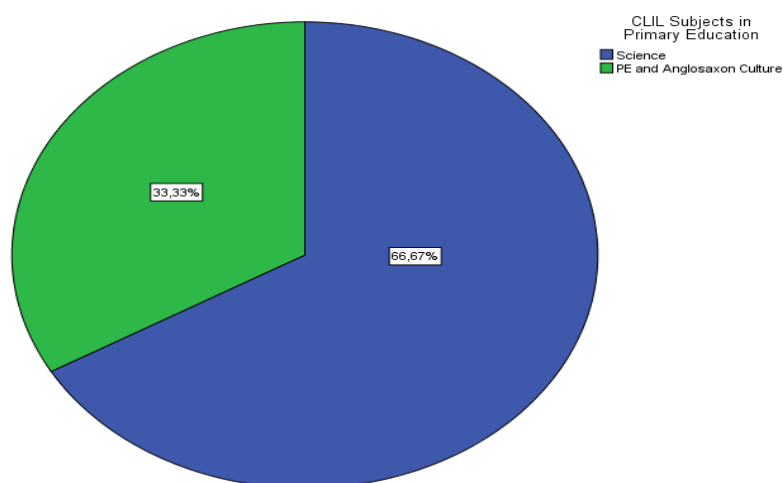


Figure 22: CLIL Subjects in Primary Education.

Science (66,67%; N=2) was the CLIL subject for two of the participants who answered affirmatively and only one student affirmed having being taught PE and Anglo-Saxon Culture in English in Primary Education (33,33%; N=1). Overall, these numbers are not enough to analyse whether CLIL in Primary Education had an impact on students' motivation and perceptions due to the low percentage (5,7%) of this subgroup in the total percentage.

### *Private English Lessons*

The fact students attend private English lessons may be due to the fact that (1) they need extra help with their English or (2) they want to improve their English for extrinsic or



even intrinsic purposes. According to the data, 60,4% of participants do not attend private English lessons while 39,6% do. This may lead to conclude that students do not feel they need help with their English or that they are not interested in improving their English outside the classroom. However, there are many factors which may come to play in this decision (e.g. parents' help with homework).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	32	60,4	60,4	60,4
	Yes	21	39,6	39,6	100,0
	Total	53	100,0	100,0	

Table 12: Private English Lessons.

Concerning differences among the three groups, only Group A stands out due to its dissimilar figures in regards to private English lessons: most students from Group A do not go to private lessons (N=13) while a minority (N=4) do. This is particularly striking as the other two observed groups do not show a significant difference within the two categories.

		Studied Groups			Total
		Group A	Group B	Group C	
Private English Lessons	No	13	9	10	32
	Yes	4	8	9	21
Total		17	17	19	53

Table 12.1: Private English Lessons (Group).

### *Parents' Level of English*

Although parents are not one of the direct observed elements in this study, it is important to take account of them as one of the main influencing entities in students' lives and parental involvement has been marked as one of the keys for CLIL success (Navés, 2009). Therefore, parents' knowledge of English could influence students' overall uptake on

CLIL. Furthermore, their knowledge of the FL may lead them to help their children with their homework.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	They do not know English	12	22,6	22,6	22,6
	They have a basic level in English	17	32,1	32,1	54,7
	They have an intermediate level in English	16	30,2	30,2	84,9
	They have an advanced level in English	8	15,1	15,1	100,0
	Total	53	100,0	100,0	

Table 13: Parents' Level of English.

As it can be appreciated, most parents have a basic level in English (32,1%) or an intermediate level (30,2%). This bodes well for a possible positive consideration of the English language on the parents' side concerning their children's studies and regarding the bilingual section. Nevertheless, it should be also accounted that 22,6% of participants stated that none of their parents know English. In order to see to what extent parental knowledge of the FL is positive towards students' CLIL experience, it is necessary to know whether parents are involved in students' CLIL experience.

Concerning differences among the three groups, it is significant that Group C shows a spike in the 'basic level' variable while the other two groups are somewhat similar in their frequencies. Having accounted the importance of students' family context in education and students' perceptions, the fact that there are significant differences among the parents from the three groups could point towards differences in students' attitudes towards English and CLIL. Hypothetically, students whose parents have a basic or low level of English (in this case, mostly Group C) may not believe English and the bilingual section are positive elements as much as their counterparts (Group A & B) due to the fact that their adult referents (their parents) have not had much contact with English.

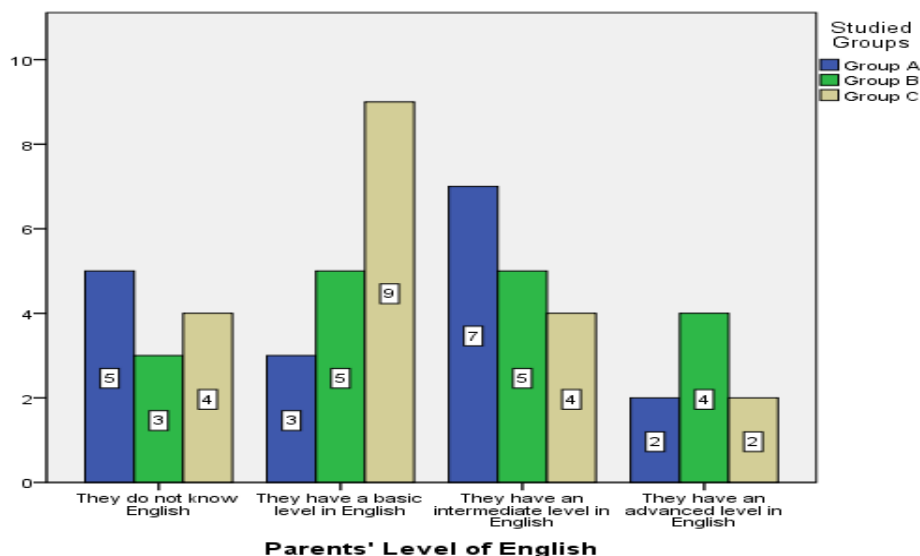


Figure 23: Parents' Level of English.

### *Parents' Help with Physics and Chemistry*

Parental involvement is an important element which may play a significant role in the implementation of the CLIL section and students' own perceptions of the methodology. Concerning the percentages on the table below, most than half of participants stated their parents did not help them studying for the CLIL subject or with their homework (56,6%; 57,7% as valid percent) while 41,5% (42,3% as valid percent) affirmed the contrary.

However, it is necessary to pay attention to these figures in regards to the three groups. According to the bar chart, Group C is reported to have the highest figure of students who are not helped by their parents in Physics and Chemistry (N=14) while Group B has the highest frequency of parents who help their children with the CLIL subject (N=10). In regards to Group A, it seems the numbers are more even than in the two other groups (N=9, No; N=7, Yes). These differences among the three groups regarding parental involvement are to be accounted in further analysis.

### Parents Help Students with Physics and Chemistry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	30	56,6	57,7	57,7
	Yes	22	41,5	42,3	100,0
	Total	52	98,1	100,0	
Missing	System	1	1,9		
Total		53	100,0		

Table 14: Parents Help with Physics and Chemistry.

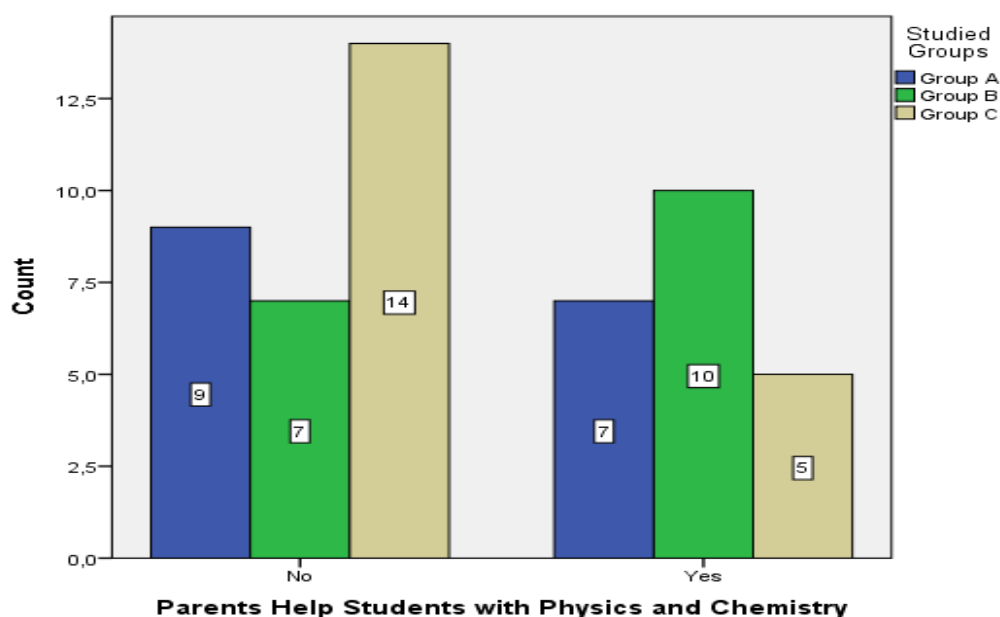


Figure 24: Parents Help Students with Physics and Chemistry.

### *Use of English with Friends*

Although parents are the main authority figure in students' lives, this does not mean they are the most influencing beings in their teenage years: during this stage, teenagers are most likely influenced by their own peers (see Chapter 5.1). Therefore, their possible use of English with their peers outside the academic realm should be considered within the motivational theories related to social interaction and social belonging (see Chapter 4.1). In regards to their use of English with friends outside the classroom, 62,3% answered they used English with friends while 37,7% replied they did not use the FL with their peers. These are encouraging results in regards to FL use outside the classroom as it could be argued that

students' desire to speak English with their peers without being 'forced' to (e.g. lessons) could be related to the concept of 'intrinsic motivation' as no external regulation is to be present in non-academic peer to peer speech.

**Students Use English with Friends**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	20	37,7	37,7	37,7
	Yes	33	62,3	62,3	100,0
	Total	53	100,0	100,0	

Table 15: Students Use English with Friends.

Concerning the three different groups, the variable figures are quite similar; therefore, it could be said this item presented homogeneous data from the three groups: the same frequency (N=11) in regards to students' use of English with friends apply to all groups. Furthermore, the number of students who answered negatively is also similar in the three groups (Group A & B: N=6; Group C: N=8).

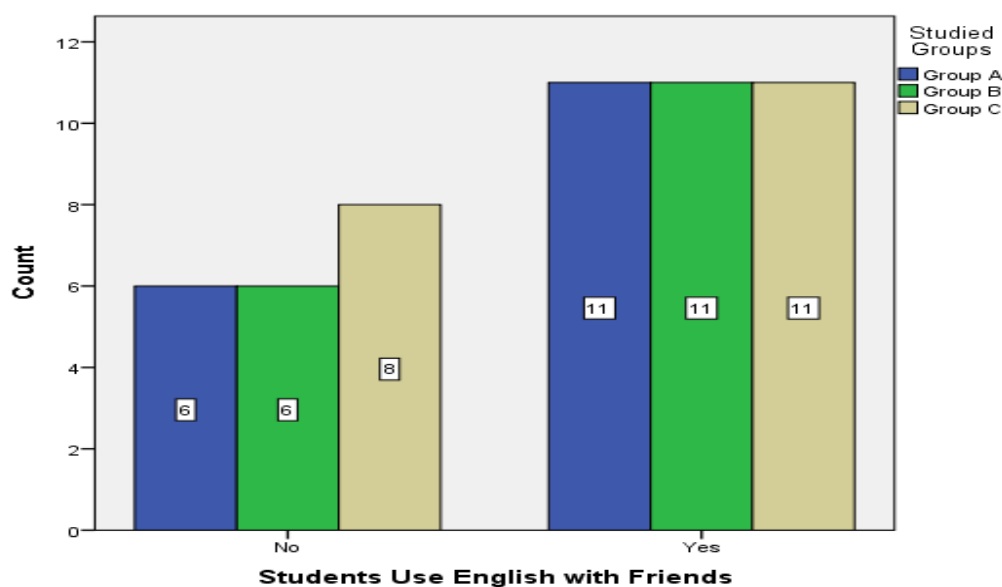


Figure 25: Students Use English with Friends.

### *Watching TV or Films in English*

Similarly to the previous analysed item, the aim behind this item is to provide information on students' contact with the foreign language outside the CLIL and EFL

classroom. Watching TV series or films are two common pastimes of teenagers nowadays. Therefore, it is relevant to know whether students chose to watch these in English or translated into their L1 to have a comprehensive overview of their contact with English outside the academic realm and to see whether they are willing to make the ‘effort’ of watching TV series and films in English in their spare time.

Overall, 58,5% of the participants of this study (59,6% as valid percent) denied watching TV or films in English while 39,6% (40,4% as valid percent) did. However, there are some significant differences when comparing the three groups: 1) Group C stands out as the group with most negative answers to this item by far (N=15); 2) Group A is the one with most affirmative answers to the question (N=11); and 3) Group A and B are more homogeneous in their figures than Group C. This could lead to conclude that, out of the three groups, Group A have the most willing participants to use English in a non-academic ludic context while Group C is the least likely to use English in such a manner.

**Watching TV and Movies in English**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	31	58,5	59,6	59,6
	Yes	21	39,6	40,4	100,0
	Total	52	98,1	100,0	
Missing	System	1	1,9		
Total		53	100,0		

Table 16: Watching TV and Movies in English.

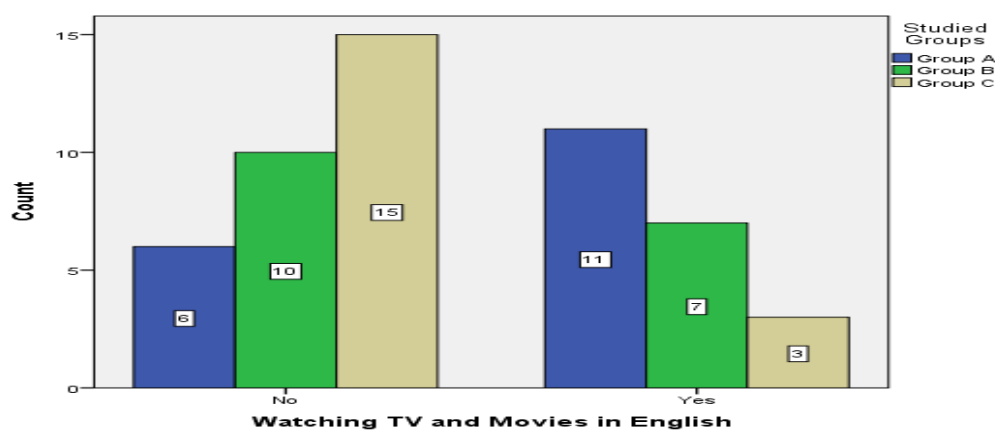


Figure 26: Watching TV and Movies in English.

### *Levels of Nervousness When Spoken to in English*

Anxiety and nervousness are some of the affective factors which may influence the CLIL learning experience (see Chapter 4.3). Hence, it is important to know whether students feel nervous when they are in contact with English. In regards to their level of nervousness when spoken in English, 52,8% of the participants stated they were not at all nervous in this case, 32,1% were a bit nervous, 11,3% were somewhat nervous and only 3,8% were very nervous. These figures are overall positive as very few participants were said to be very or quite nervous in this situation: this may be related to the fact students are used to being spoken in English by the English teacher and the CLIL teacher on a daily basis.

In regards to the three studied groups, it can be appreciated in the graph below that Group B is the one with the lowest levels of nervousness when confronted with someone speaking in English. Contrary to this, Group C is seen as having the highest levels of nervousness out of the three groups (N=3, ‘Somewhat nervous’; N=1, ‘Very much nervous’), though this difference is not very significant due to its low frequency.

**Nervous When Spoken to in English**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	28	52,8	52,8	52,8
	A bit	17	32,1	32,1	84,9
	Somewhat nervous	6	11,3	11,3	96,2
	Very much nervous	2	3,8	3,8	100,0
	Total	53	100,0	100,0	

Table 17: Level of Nervousness When Spoken to in English.

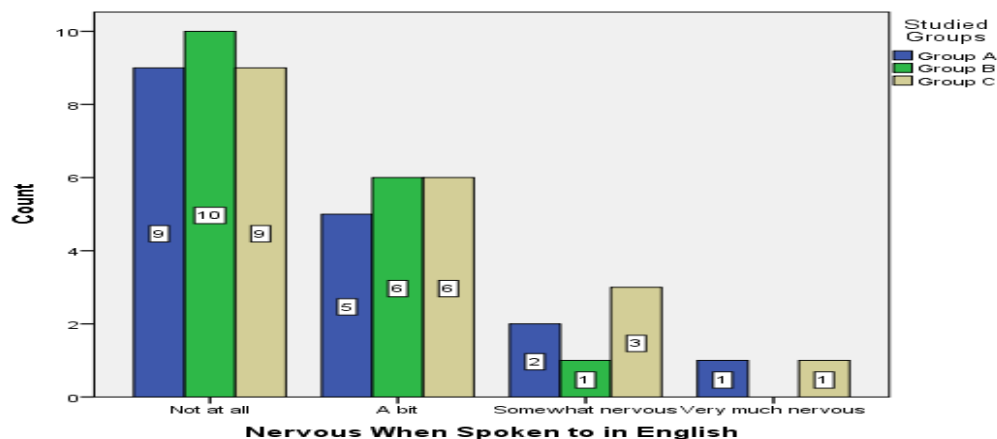


Figure 27: Level of Nervousness When Spoken to in English.

### *Level of Confidence When Speaking in English*

One of the main aims of the implementation of the CLIL sections is to improve students' communicative competence: longer and meaningful contact with the foreign language is set to improve students' speaking skills. As Dalton-Puffer (2008) and Nieto-Moreno (2016) state, fluency is one of the elements which have been improved thanks to the CLIL methodology. In regards to their levels of confidence when speaking in English, 50,9% of participants stated they were somewhat confident in their Spoken English, followed by those who were a bit confident (20,8%), very confident (15,1%) and no confident at all (13,2%). Overall, these figures bode well on students' confidence speaking English, though it must not be forgotten these are students' own perceptions; thus, they may not reflect the reality.

In regards to the differences among groups, Group A has the highest number of students who replied 'Somewhat confident' to this question and no participant from Group A chose the 'Not at all' option in this item. Furthermore, it is also worth mentioning that a considerable number of participants from Group C chose the 'Not at all' option (N=5) and the 'Very confident' option (N=4); thus, becoming the group with most participants who chose the most contrastive options ('not confident at all' and 'very confident'), though it should be



pointed out there are not enough participants in this categories to study this feat in depth and providing concluding results.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	7	13,2	13,2	13,2
	A bit	11	20,8	20,8	34,0
	Somewhat confident	27	50,9	50,9	84,9
	Very confident	8	15,1	15,1	100,0
	Total	53	100,0	100,0	

Table 18: Level of Confidence Speaking in English.

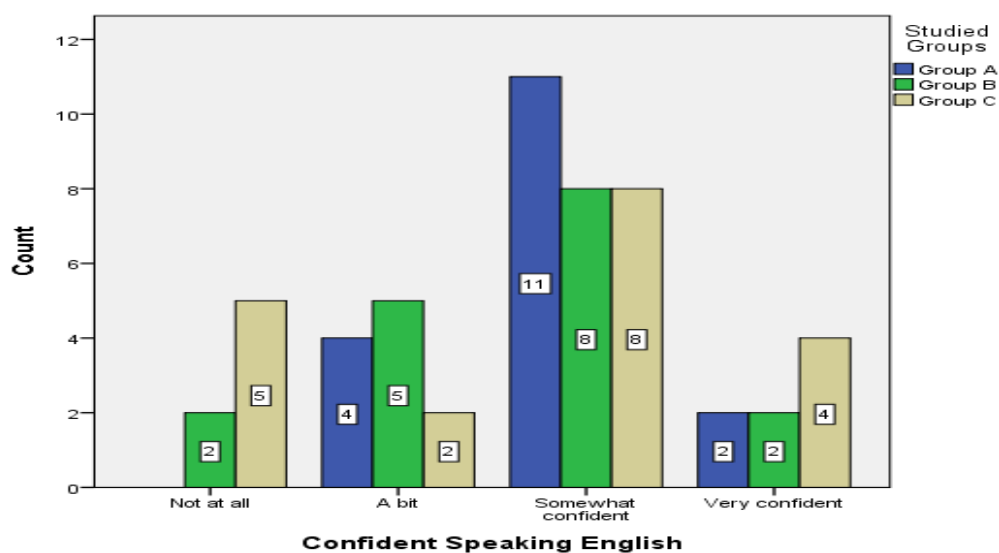


Figure 28: Level of Confidence Speaking English.

### 6.1.2. Feelings

This subheading endeavours to elicit students' perceptions of their foreign language level and the degree of satisfaction in regards to the CLIL section. In order to do so, most of the items of this subsection follow a Likert scale structure, though other types of items (e.g. yes-no questions, tables) were used. As affective factors and motivation are some of the key concepts of this doctoral dissertation, the data gathered from these items is highly relevant to complete the second aim of the study and to answer the research questions.

### *Overall Satisfaction with the CLIL Section*

Satisfaction is a somewhat abstract concept which is built upon personal experiences, expectations, goals and affective elements. Hence, students' levels of satisfaction with the CLIL section may differ greatly from student and group as ID's are surely to play a role in this. Looking at the overall percentages from the three groups, it is clear that two of the variables from the Likert scale item are the most commonly found: 'neutral' satisfaction (35,8%) and 'high' satisfaction with the CLIL section (26,4%). Overall, 'neutral' satisfaction is the choice which is most found in the data results; this, it may be said that the participants do not have very strong opinions (very low, very high) on the CLIL section. However, taking a closer look at the table of percentages it is clear that, although 'neutral' satisfaction is the most common answer, the joint percentages of 'high' (26,4%) and 'very high' (11,3%) (Sum of both results: 37,7%) surpass by more than 20% the joint percentages of 'very low' (9,4%) and 'low' (17,0%) (Sum of both results: 26,4%). Therefore, it could be said there is a tendency towards a positive appreciation of CLIL as the sum of the percentages on 'high' and 'very high' satisfaction are significantly higher than the sum of 'very low' and 'low' percentages.

However, some issues on the satisfaction levels of the three groups have been found. Although the graph below shows an overall similar frequency from the three groups in some variables –e.g. 'high' satisfaction: N=6 (Group A) and N=4 (Group B & C)–, there are some significant differences which have an impact on the general results and the specific group results regarding satisfaction:

- 1) There is a spike in the 'neutral' satisfaction variable in Group B (N=10) which stands out in comparison to the other two groups.

- 2) Group B has the lowest number of students dissatisfied with the CLIL section: no 'very low' figures and only one participant from this group has a 'low' level of satisfaction (11,1% of the total percentage for this variable).
- 3) In contrast to this last point, Group C has the highest numbers of participants who chose the options of 'very low' (N=4) and 'low' (N=6): both these numbers stand out in the graph in comparison to the data gathered from Group A and B. This may lead to conclude that most of the overall percentage of the table from these two variables (26,4%) was from the data in Group C: 80% of the 'very low' satisfaction data was found in Group C and 66,7% of the data regarding the 'low' variable was found in this group as well.
- 4) Group A seems to be the group with the highest satisfaction in regards to the CLIL section. Group A's percentages among the total of each variable seem to rise in the satisfaction ('high' and 'very high') categories: 42,9% of the total of participants who chose 'high' were from this group and 50,0% of those who chose 'very high' were from Group A as well. Taking a look at the figures on the 'Satisfaction with the CLIL Section (Percentages by Variables)' table, the percentage levels from Group A in the overall count rise proportionally along the variables which show levels of satisfaction: 20,0% ('very low'), 22,2% ('low'), 26,3 ('neutral'), 42,9% ('high') and 50,0% ('very high'). According to these numbers, Group A is the most satisfied group with the CLIL section.

### Satisfaction with the CLIL Section

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very low	5	9,4	9,4	9,4
	Low	9	17,0	17,0	26,4
	Neutral	19	35,8	35,8	62,3
	High	14	26,4	26,4	88,7
	Very high	6	11,3	11,3	100,0
	Total	53	100,0	100,0	

Table 19: Level of Satisfaction with the CLIL Section.

### Satisfaction with the CLIL Section (Percentages by Variables)

			Studied Groups			Total
			Group A	Group B	Group C	
Satisfaction with the Bilingual Section	Very low	Count	1	0	4	5
		% within Satisfaction with the Bilingual Section	20,0%	0,0%	80,0%	100,0%
	Low	Count	2	1	6	9
		% within Satisfaction with the Bilingual Section	22,2%	11,1%	66,7%	100,0%
	Neutral	Count	5	10	4	19
		% within Satisfaction with the Bilingual Section	26,3%	52,6%	21,1%	100,0%
	High	Count	6	4	4	14
		% within Satisfaction with the Bilingual Section	42,9%	28,6%	28,6%	100,0%
	Very high	Count	3	2	1	6
		% within Satisfaction with the Bilingual Section	50,0%	33,3%	16,7%	100,0%
	Total	Count	17	17	19	53
		% within Satisfaction with the Bilingual Section	32,1%	32,1%	35,8%	100,0%

Table 19.1: Level of Satisfaction with the CLIL Section (Percentages by Variables).

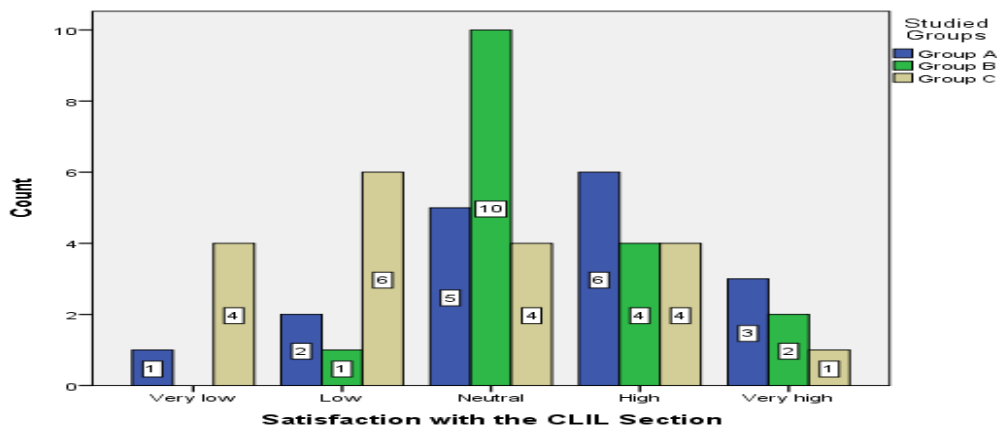


Figure 29: Level of Satisfaction with the CLIL Section.

### *Willingness to Choose the CLIL Section (If Optional)*

As it has been pointed out, bilingual centres provide students and parents the option to become part of the CLIL section or to choose the traditional content subject group. This is not the case in plurilingual centres as the CLIL section is mandatory to all students who do not have specific learning difficulties. Therefore, the participants of this study did not have a choice on whether to choose the CLIL section or not. According to the figures on the table below, 50,9% (52,9% as valid percent) of students would not have chosen the CLIL section while 45,3% (47,1% as valid percent) would have picked this option. However, the similarity of these figures (less than a 10% difference) needs to be analysed bearing in mind the answers in the three groups.

As it can be appreciated on the graph, the frequencies of Group C are the least homogeneous of the three groups: Group C has the highest frequency of all the groups (N=14) when answering negatively to choosing the CLIL section if optional; likewise, the lowest frequency of 'yes' answers is found in this group (N=5). This leads to conclude Group C is the least willing to hypothetical choose the CLIL option. In contrast to this, Group A would be the group with the highest frequency of participants who would willingly choose to be part of the CLIL section (N=11). Concerning Group B, the data is quite homogeneous with

only a very small difference between the number of Group B students who would choose to belong to the CLIL section (N=8) and those who answered negatively to this hypothesis (N=7).

### Willingness to Choose the CLIL Section If Optional

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	27	50,9	52,9	52,9
	Yes	24	45,3	47,1	100,0
	Total	51	96,2	100,0	
Missing	System	2	3,8		
Total		53	100,0		

Table 20: Willingness to Choose the CLIL Section.

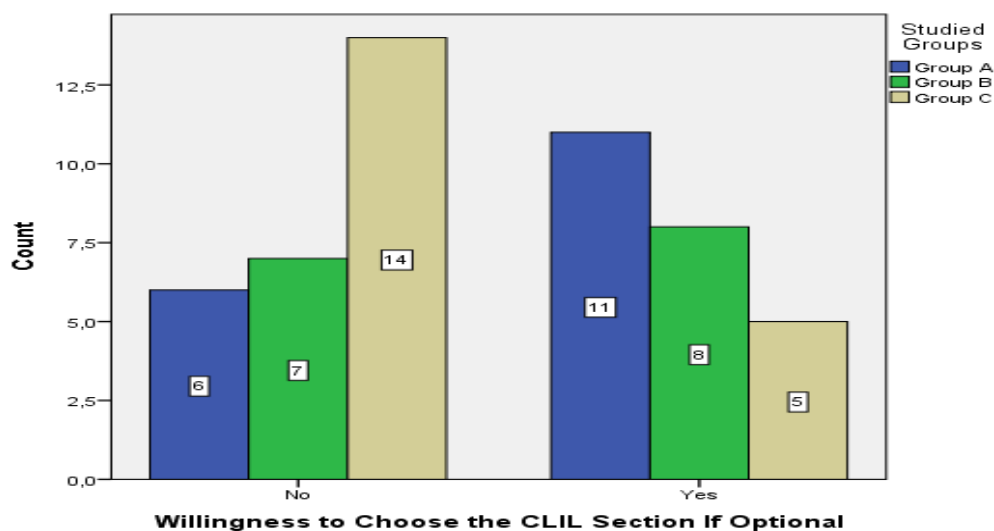


Figure 30: Willingness to Choose the CLIL Section If Optional.

### *Difficulties in Physics and Chemistry due to English*

Students' perceptions on content and language difficulties may vary according to their English level and the content. Knowing whether students find difficulties concerning the use of the FL in the content subject may allow to identify key issues in students' learning process which could influence their perspectives on CLIL as well as their learning performance. When asked whether English made Physics and Chemistry more difficult, 41,5% of the participants strongly agreed with this option, 9,4% agreed, 15,1% were undecided, 26,4%

disagreed with this statement and 7,5% disagreed. Thus, the highest percent (41,5%: strongly agree) points out that students perceive English as a drawback when learning the content subject, though this does not mean students perceive the use of the FL specifically counterproductive but they are aware of the extra challenge it is English as the language of instruction.

Concerning differences among the three groups, the graph below shows that Group C follows a similar line as in the two previous items and stands out due to its high frequency in the ‘strongly agree’ variable (N=12); this is to be compared later with students’ perceived level of English as the difficulty of the FL may not be as much related as its use in Physics and Chemistry but to a general level of English. In regards to the other groups, Group B is the least likely to agree on the statement that the FL makes learning Physics and Chemistry harder (N=3, ‘strongly disagree’; N=7, ‘disagree’); this could be extrinsically related to their language competence. With respect to Group A, its highest frequency (N=8) is found in the ‘strongly agree’ variable, though ‘disagree’ is not far behind (N=7) so it could be said this is the group in which most dissimilar perspectives (as most of Group C either chose ‘strongly agree’ or ‘disagree’) on the statement are found.

#### English Makes Physics and Chemistry More Difficult

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	22	41,5	41,5	41,5
	Agree	5	9,4	9,4	50,9
	Undecided	8	15,1	15,1	66,0
	Disagree	14	26,4	26,4	92,5
	Strongly disagree	4	7,5	7,5	100,0
	Total	53	100,0	100,0	

Table 21: English Makes Physics and Chemistry More Difficult.

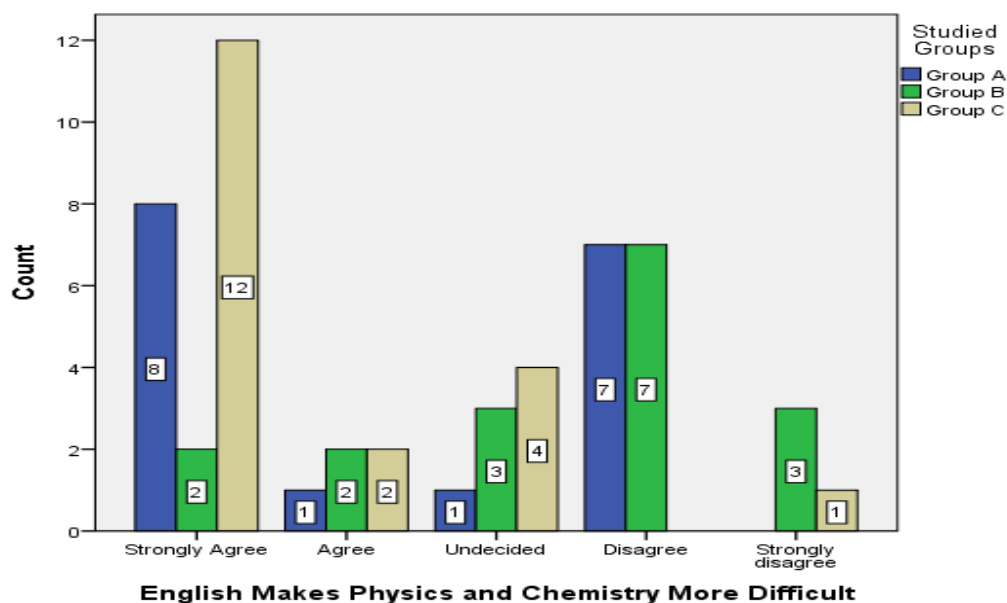


Figure 31: English Makes Physics and Chemistry More Difficult.

### *Improving English by Means of Physics and Chemistry*

It has been proved that meaningful contact with a language would have positive consequences to the learner's language proficiency. In this case, students are in contact with English by means of the traditional EFL lessons and the CLIL subject. However, it is important to find out whether students feel this contact with English in CLIL to be beneficial to their proficiency in English. By using a statement such as 'Physics and Chemistry in English helps me improve my English skills' and asking students to rate it following Likert scale, it was found out that 34,0% (34,6% as valid percent) strongly agree with this statement, 30,2% (30,8% as valid percent) agree, 17% (17,3% as valid percent) are undecided, 9,4% (9,6% as valid percent) disagree and 7,5% (7,7% as valid percent). It is quite clear most students believe that using the FL in Physics and Chemistry helps them with English to some extent.

Although the overall percentages show a positive attitude towards the statement, these figures need to be contextualised in regards to the three groups. As it happened in the three last items, Group C has a tendency towards negative perceptions when it comes to CLIL (e.g.



low levels of satisfaction, overall unwillingness to choose the CLIL section if optional); in this item, this group seems to have the most significant frequencies in the ‘disagree’ (N=4) and ‘strongly disagree’ (N=3) options, especially if compared to the other two groups in which nor Group A or B show significant frequencies in these two variables. In fact, according to the graph Group A and B have similar frequencies and both groups tend towards the ‘strongly agree’ (Group A: N=5; Group B: N=8) and ‘agree’ options (Group A: N=8; Group B: N=5). This may lead to conclude that while most participants from Group A and B believe that having the content subject in English helps them improve said FL, Group C is less likely to believe their English have improved thanks to the CLIL lessons, though this last statement should not be generalised to all Group C as a significant number of their participants also chose ‘strongly agree’ (N=5), ‘agree’ (N=3) and ‘undecided’ (N=4).

#### Physics and Chemistry in English Helps Me Improve My English Skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	18	34,0	34,6	34,6
	Agree	16	30,2	30,8	65,4
	Undecided	9	17,0	17,3	82,7
	Disagree	5	9,4	9,6	92,3
	Strongly disagree	4	7,5	7,7	100,0
	Total	52	98,1	100,0	
Missing	System	1	1,9		
Total		53	100,0		

Table 22: Physics and Chemistry in English Helps Students Improve Their English Skills.

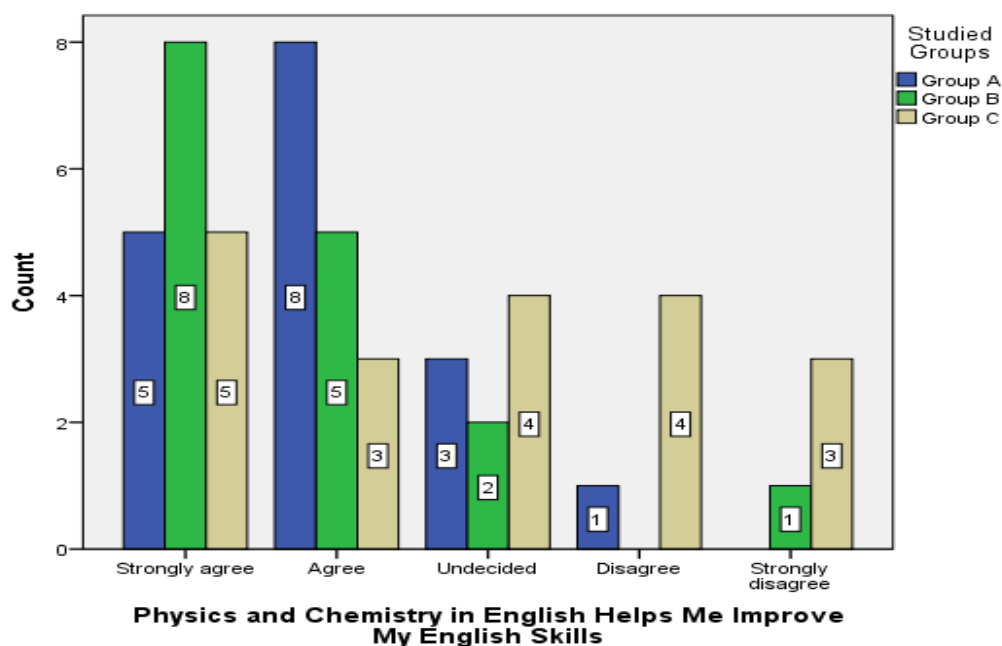


Figure 32: Physics and Chemistry in English Helps Students Improve Their English Skills.

### *Worries at the Beginning of the CLIL Section*

It is not unusual to have worries or even anxiety when faced with a new situation. Although students had a CLIL subject on their first year of secondary education, this was the first time they had Physics and Chemistry so some concerns may have risen at the beginning of the course. The data gathered by means of the questionnaire supports this idea: 71,7% of the participants of this study had concerns at the beginning of the course in regards to the CLIL subject in contrast to 28,3% who did not have any worries.

Although seven different answers on students' worries at the beginning of the course were given, only two worries were repeated more than once:

1. Not understand things due to the language.
2. The subject being too difficult.

Concerning the three groups, no significant differences are found but a slight increase in Group B's 'No' figure (N=7) which may be significant to analyse the following item ('Current Worries').

### Worries at the Beginning of the CLIL Section

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	15	28,3	28,3	28,3
	Yes	38	71,7	71,7	100,0
	Total	53	100,0	100,0	

Table 23: Worries at the Beginning of the CLIL Section.

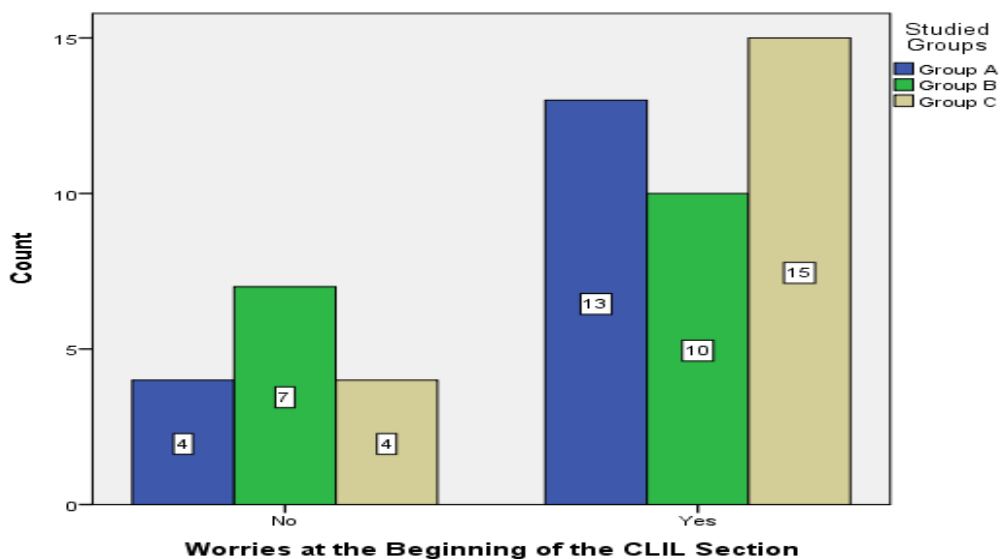


Figure 33: Worries at the Beginning of the CLIL Section.

### Current Worries

As it has been previously mentioned, motivation and perceptions fluctuate throughout time. Taking into account the analysis of the previous item ('Worries at the Beginning of the CLIL Section'), it is necessary to study whether these worries have changed after students' first months in the CLIL section. In direct contrast to previous data, the majority of participants in the study stated they did not have any current worries at the moment the questionnaire was handed (71,7%; 76,0% as valid percent). In regards to those who did have some worries, a subclassification was necessary as some students pointed out they still had the same worries as they had at the beginning (15,1%; 16,0% as valid percent) while 7,5% of students (8,0% as valid percent) stated they had some worries but they did not specify on

their worries. According to the numbers, students seem to lose some concerns regards the CLIL sections with time.

In regards to the three groups, Group B is once again the group with less worried students as the number of students who answered negatively to having any concerns at the beginning of the course (N=7) has duplicated (N=14) and only two students (N=2) reported having the same concern as before. Figures have also gone significantly up in regards to Group A and C: while only four students (N=4) of each of these groups did not have any worries at the beginning of the course, this number has triplicated (N=12) when asked about current worries. This is encouraging from a practical point of view: students' concerns on the challenges the CLIL section diminish once they face the classroom reality; therefore, students' opinions have changed once they experimented the CLIL methodology and the day-to-day classroom reality.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	38	71,7	76,0	76,0
	Yes	4	7,5	8,0	84,0
	Same worries as before	8	15,1	16,0	100,0
	Total	50	94,3	100,0	
Missing	System	3	5,7		
Total		53	100,0		

Table 24: Current Worries.

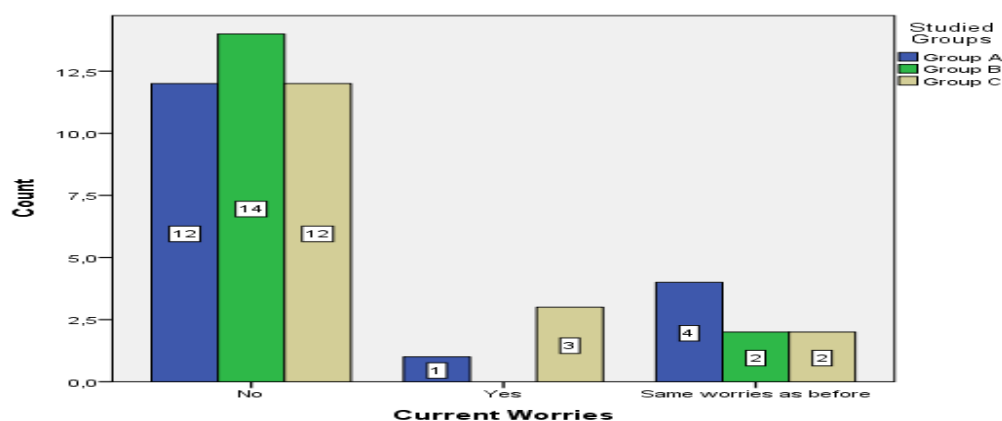


Figure 34: Current Worries.

### *Level of English: Students' Self-Perceptions*

In order to gather information on students' self-perceptions of their language skills, they were provided with a table to mark their level of English in the main four skills: reading, listening, writing and speaking.

#### *Reading Comprehension*

According to the figures on the table below, most students think their reading skills are average (35,8%) or high (35,8%), followed by those who think their level is low (17%), very high (9,4%) and very low (1,9%). Concerning the three groups, Group A's highest percentage (41,2%) is found in the 'average' variable, Group B has the same percentage in 'average' and 'high' (41,2%) while Group C's highest percentage is in the 'high' variable (31,6%) though they also present the highest percentages in 'very low' (5,3%) and 'low' (21,1%). It is also worth mentioning that only Group C has some percentages in all variables.

#### **Perceived Level of Reading Comprehension in English**

		Studied Groups				Total
		Group A	Group B	Group C		
Perceived Level of Reading Comprehension in English	Very low	Count	0	0	1	1
		% within Studied Groups	0,0%	0,0%	5,3%	1,9%
	Low	Count	2	3	4	9
		% within Studied Groups	11,8%	17,6%	21,1%	17,0%
	Average	Count	7	7	5	19
		% within Studied Groups	41,2%	41,2%	26,3%	35,8%
	High	Count	6	7	6	19
		% within Studied Groups	35,3%	41,2%	31,6%	35,8%
	Very high	Count	2	0	3	5
		% within Studied Groups	11,8%	0,0%	15,8%	9,4%
	Total	Count	17	17	19	53
		% within Studied Groups	100,0%	100,0%	100,0%	100,0%

Table 25: Perceived Level of Reading Comprehension in English.

### Writing

Overall, the highest percentage for these variables is found on the ‘average’ variable (52,8%) followed by ‘very high’ (26,4%), ‘low’ (13,2%), ‘very high’ (3,8%) and ‘very low’ (3,8%). In regards to the figures within the groups, the highest figure of Group A is under the ‘average’ variable (70,6%), Group B shows again a tie for the highest percentage (41,2%) in ‘average’ and ‘high’ (like in the previous analysed item), and Group C’s highest percentage is found in the ‘average’ category (47,4%) and once again it is the only group who has some percentage in all the variables.

#### Perceived Level of Writing in English

			Studied Groups			
			Group A	Group B	Group C	Total
Perceived Level of Writing in English	Very low	Count	0	0	2	2
		% within Studied Groups	0,0%	0,0%	10,5%	3,8%
	Low	Count	1	3	3	7
		% within Studied Groups	5,9%	17,6%	15,8%	13,2%
	Average	Count	12	7	9	28
		% within Studied Groups	70,6%	41,2%	47,4%	52,8%
	High	Count	3	7	4	14
		% within Studied Groups	17,6%	41,2%	21,1%	26,4%
	Very high	Count	1	0	1	2
		% within Studied Groups	5,9%	0,0%	5,3%	3,8%
Total	Count	17	17	19	53	
	% within Studied Groups	100,0%	100,0%	100,0%	100,0%	

Table 26: Perceived Level of Writing in English.

### Listening Comprehension

In the same line as the two previous items, the highest percentage (41,5%) belongs to the ‘average’ variable, followed by ‘high’ (28,3%), ‘low’ (13,2%), ‘very high’ (11,3%) and ‘very low’ (5,7%). It is also worth considering that the ranking of these variables from highest to lowest follow the same order as the item which measure reading comprehension: both of the skills (reading and listening) are receptive skills. According to research (see Chapter 4.2), receptive skills are improved thanks to the CLIL methodology so there may be

a relationship with the theory and the data in this study. Concerning the groups' percentages, the highest percentage is found in the 'average' variable for the three groups (Group A: 41,2%; Group B: 47,1%; Group C: 36,8%). Furthermore, it should be also mentioned this is the only skill in which some sort of percentage is found in the 'very high' variable for the three groups (Group A: 5,9%; Group B: 11,8%; Group C: 15,8%).

### Perceived Level of Listening Comprehension in English

		Studied Groups			Total	
		Group A	Group B	Group C		
Perceived Level of Listening Comprehension in English	Very low	Count	0	1	2	3
		% within Studied Groups	0,0%	5,9%	10,5%	5,7%
	Low	Count	3	1	3	7
		% within Studied Groups	17,6%	5,9%	15,8%	13,2%
	Average	Count	7	8	7	22
		% within Studied Groups	41,2%	47,1%	36,8%	41,5%
	High	Count	6	5	4	15
		% within Studied Groups	35,3%	29,4%	21,1%	28,3%
	Very High	Count	1	2	3	6
		% within Studied Groups	5,9%	11,8%	15,8%	11,3%
	Total	Count	17	17	19	53
		% within Studied Groups	100,0%	100,0%	100,0%	100,0%

Table 27: Perceived Level of Listening Comprehension in English.

### *Speaking*

Overall, speaking may be considered the most challenging skill to acquire due to its productive rather than receptive nature, its usual 'short preparation' time and a possible fear of being embarrassed talking to other people in a FL. In regards to the participants of the study, 50,9% feel they level of spoken English is average, followed by those who chose 'low' (20,8%), 'high' (15,1%), 'very low' (7,5%) and 'very high' (5,7%). Similarly to their listening level, the highest percentages for the three groups belong in the 'average' variable (Group A: 52,9%; Group B: 64,7%; Group C: 36,8%).

### Perceived Level of Speaking in English

		Studied Groups				
		Group A	Group B	Group C	Total	
Perceived Level of Speaking in English	Very low	Count	1	1	2	4
		% within Studied Groups	5,9%	5,9%	10,5%	7,5%
	Low	Count	3	3	5	11
		% within Studied Groups	17,6%	17,6%	26,3%	20,8%
	Average	Count	9	11	7	27
		% within Studied Groups	52,9%	64,7%	36,8%	50,9%
	High	Count	3	2	3	8
		% within Studied Groups	17,6%	11,8%	15,8%	15,1%
	Very high	Count	1	0	2	3
		% within Studied Groups	5,9%	0,0%	10,5%	5,7%
Total		Count	17	17	19	53
		% within Studied Groups	100,0%	100,0%	100,0%	100,0%

Table 28: Perceived Level of Speaking in English.

#### 6.1.3. Activities

The items analysed in this subheading endeavour to collect specific information on the classroom practice regarding issues such as languages used in the classroom by students and the teacher, opinion on content materials (e.g. textbook) and activities. The results of these items are to be considered not only in the study of CLIL and motivation of these groups (Aim 2) but also in the creation of the proposed guidelines in Chapter 7 (Aim 3).

#### *Students' Use of English and Spanish/Galician in the CLIL Classroom (Percentages)*

Although English is the language of instruction in the Physics and Chemistry lessons, this does not mean students use only the FL. After the pilot observation was carried out, it was clear students (and the teacher in some occasions) used the mother tongue in CLIL lessons. As language is one of the key points in CLIL, it is necessary to pay attention to this phenomenon so to understand how language is managed in the classroom as well as students' perceptions of their own language use. Overall, the percentages for both languages are quite similar. Looking at the mean on the tables below, students divided their use of languages in the classroom in percentages: 41,05% in English and 58,94% in Spanish/Galician.



### Percentages of English Used by Students in the Classroom

	N	Minimum	Maximum	Mean	Std. Deviation
Perceived Percentage of English Used in the Classroom	52	,00	90,00	41,0577	24,74055
Valid N (listwise)	52				

Table 29: Percentages of English Used by Students in the Classroom.

### Percentages of Spanish/Galician Used by Students in the Classroom

	N	Minimum	Maximum	Mean	Std. Deviation
Perceived Percentage of Spanish/Galician Used in the Classroom	52	10,00	100,00	58,9423	24,74055
Valid N (listwise)	52				

Table 30: Percentages of Spanish/Galician Used by Students in the Classroom.

However, a closer look to these numbers needs to be provided. Concerning the three different groups the median of the percentages related to language use, the following figures were found:

- Group A: 35% (English); 65% (Spanish/Galician).
- Group B: 50% (English); 50% (English)
- Group C: 30% (English); 70% (Spanish/Galician)

These numbers specify students' perceived use of English and the L1 in the three different groups. Taking into account these figures, Group A is the most balanced in regards to use of English (50%) and use of Spanish/Galician (50%) while Group A and C show a higher use of the L1 (65% and 70% respectively) than the FL (35% and 30% respectively). Nevertheless, it should not be forgotten these figures are the result of students' perceptions of their own use which clash with the teacher's own perception (see Chapter 6.2).

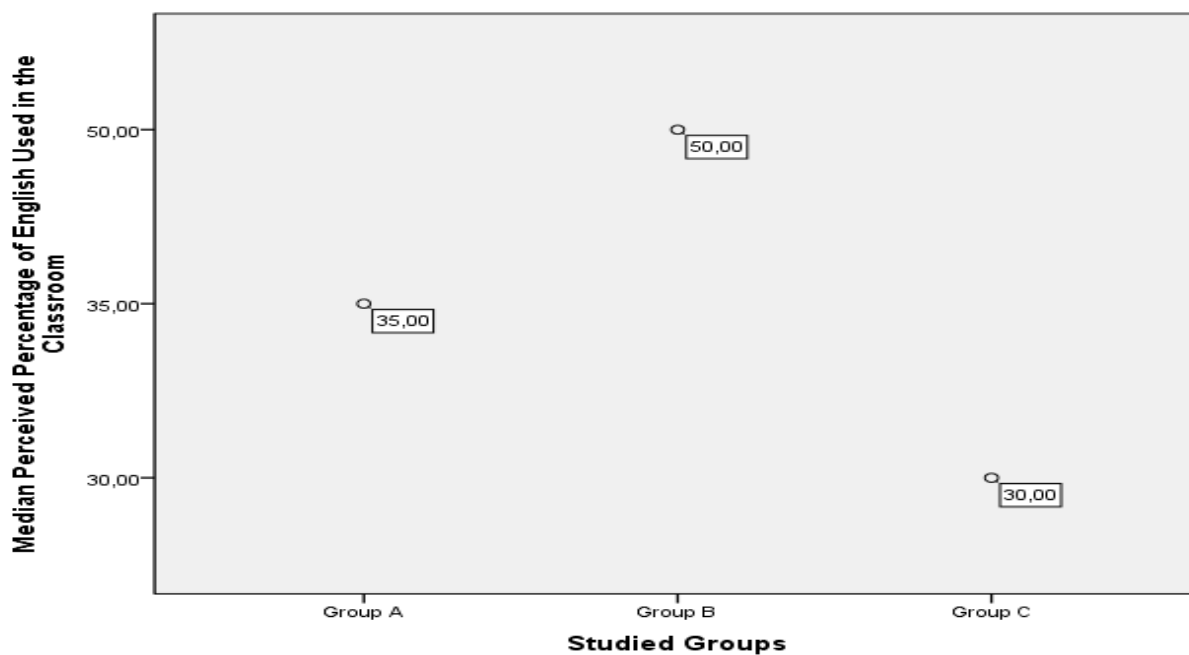


Figure 35: Perceived Percentage of English Used by Students.

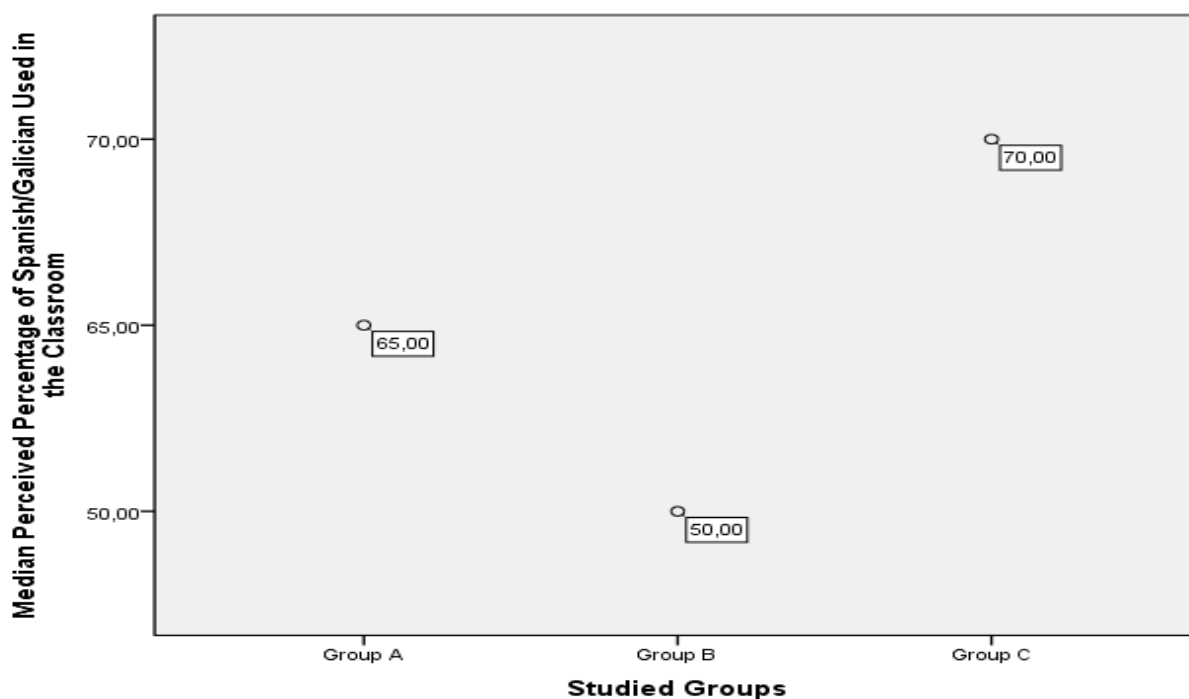


Figure 36: Perceived Percentage of Spanish/Galician Used by Students.

### *Teacher's Use of English and Spanish/Galician in the CLIL Classroom (Percentages)*

Students were asked to provide percentages on the CLIL teacher's language use in the same way as in the previous item. According to the data provided in the questionnaires, the means for the CLIL teacher's language use are 83,17% (English) and 16,82%

(Spanish/Galician). It is clear students think the CLIL teacher speaks mostly English in the CLIL classroom; this is further supported by the information acquired in the teacher's interview on his own language use (see Chapter 6.2) and the systematic classroom observation (see Chapter 6.3).

**Percentages of English Used by the Teacher in the Classroom**

	N	Minimum	Maximum	Mean	Std. Deviation
Perceived Percentage of English Used by the Teacher in the Classroom	52	15,00	100,00	83,1731	18,85520
Valid N (listwise)	52				

Table 31: Percentages of English Used by the Teacher in the Classroom.

**Percentages of Spanish/Galician Used by the Teacher in the Classroom**

	N	Minimum	Maximum	Mean	Std. Deviation
Perceived Percentage of Spanish/Galician used by the Teacher in the Classroom	52	,00	85,00	16,8269	18,85520
Valid N (listwise)	52				

Table 32: Percentages of Spanish/Galician Used by the Teacher in the Classroom.

In regards to the three studied groups, their percentages on the CLIL teacher's language use show little variation:

- Group A: 90% (English); 10% (Spanish/Galician).
- Group B: 90% (English); 10% (Spanish/Galician).
- Group C: 85% (English); 15% (Spanish/Galician).

As it can be appreciated, the percentages from Group C slightly differ from the other two groups. This is probably related to the fact the CLIL teacher usually uses the L1 to discipline students and, as he admits when interviewed, he uses the L1 more with Group C as this group is quite undisciplined, thus, he needs to tell them off more often than to the other two groups.

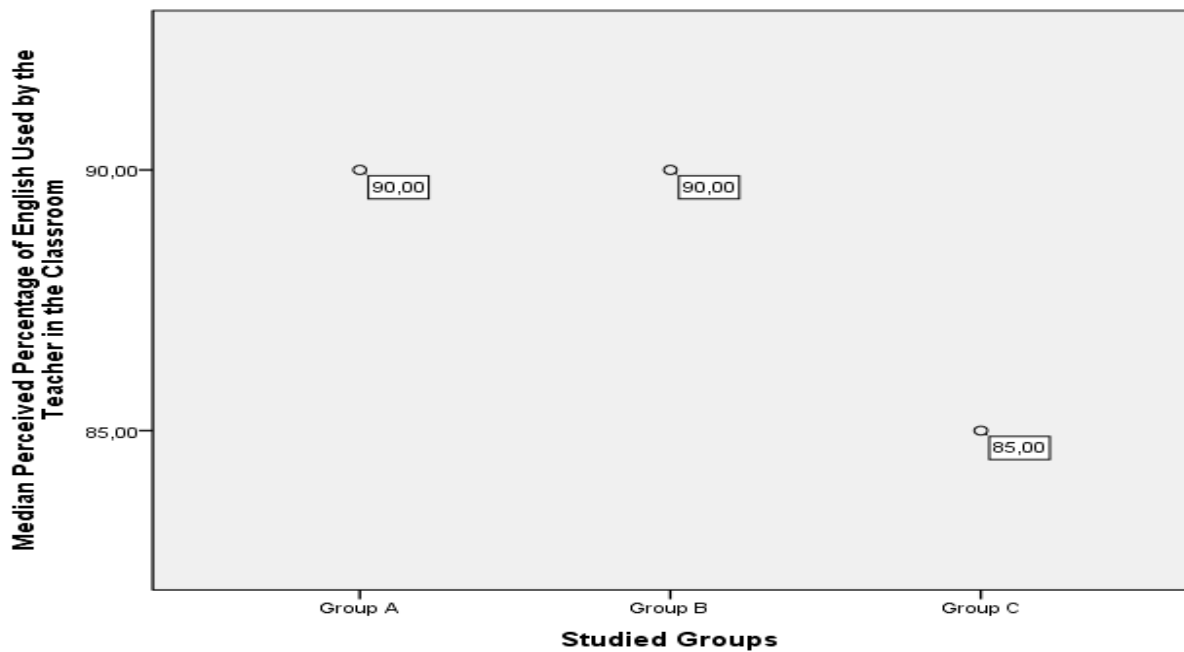


Figure 37: Perceived Percentage of English Used by the Teacher.

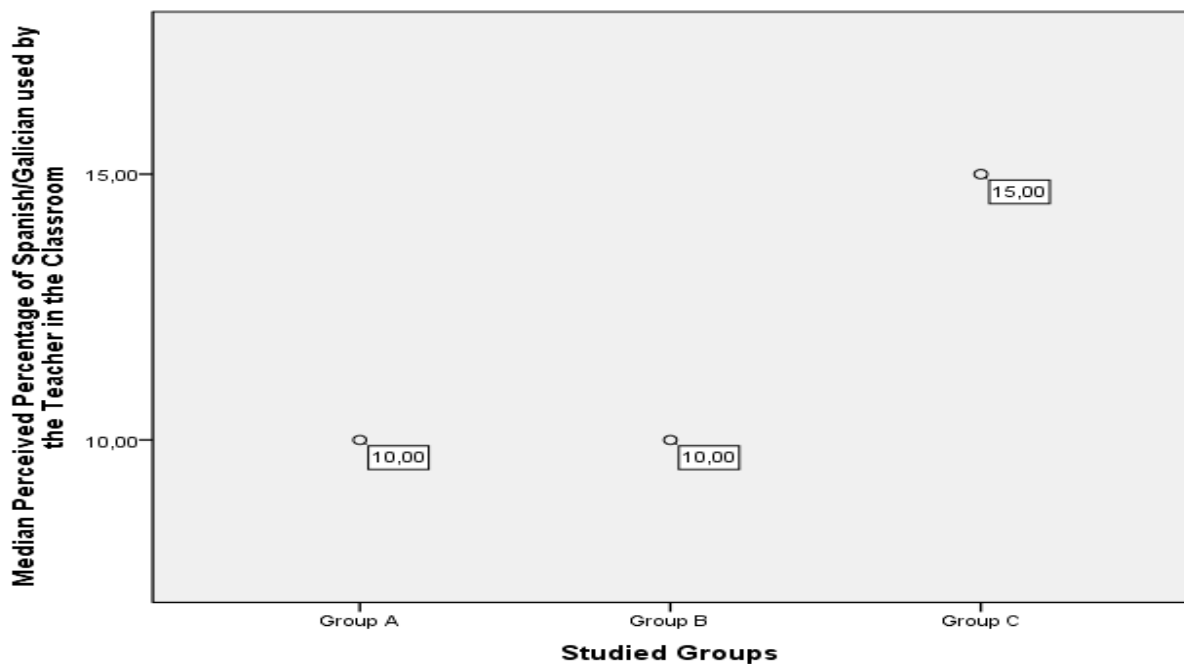


Figure 38: Perceived Percentage of Spanish/Galician Used by the Teacher.

### *Language Used to Ask Questions*

As it has been pointed out, the FL and the L1 take part in the in-classroom speech in different measures. Taking into account that the choice of the L1 or the FL may be influenced by the type of speech (e.g. answering questions, talking among students), it is important to

know students' language use when it comes to asking questions: asking questions during the lesson is an optional speech act which is carried out by students when faced with some difficulties in the classroom, to receive further feedback from the teacher or to elicit more information on the issue at hand. Therefore, if questions in the classroom are a means to analyse students' interest or engagement to the subject (see Chapter 6.3), the language used in these cases would provide information not only on students language proficiency but also on their engagement with the FL and L1.

According to the information gathered from the questionnaires, 32,1% (37% as valid percent) of students use only English to ask questions while Spanish is used at a higher percentage (35,8%; 41,3% as valid percent). However, 15,1% of students (17,4% as valid percent) ticked both languages in the questionnaire (English and Spanish). Furthermore, a small percentage (3,8%; 4,3% as valid percent) also chose to mark two languages (Spanish and Galician).

Nevertheless, some differences are found when the data is analysed in regards to the three groups: Group B is the group with the highest frequency of students who chose English as the language used when asking questions (N=9) while Group C presents the highest frequency in the Spanish variable (N=8). Furthermore, only two participants (N=2) from the latter group chose the 'Spanish and Galician' variable. These numbers resonate with the percentages on students' language use in the classroom (Group A being the one with the highest English percentages and Group C with the highest percentages of Spanish/Galician). In regards to Group A, it is clear that its frequencies are similar in the three variables this group is present: 'English' (N=5), 'Spanish' (N=4) and 'Both (English & Spanish)' (N=4).

Language Used to Ask Questions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	English	17	32,1	37,0	37,0
	Spanish	19	35,8	41,3	78,3
	Both (English & Spanish)	8	15,1	17,4	95,7
	Spanish and Galician	2	3,8	4,3	100,0
	Total	46	86,8	100,0	
Missing	System	7	13,2		
Total		53	100,0		

Table 33: Language Used to Ask Questions.

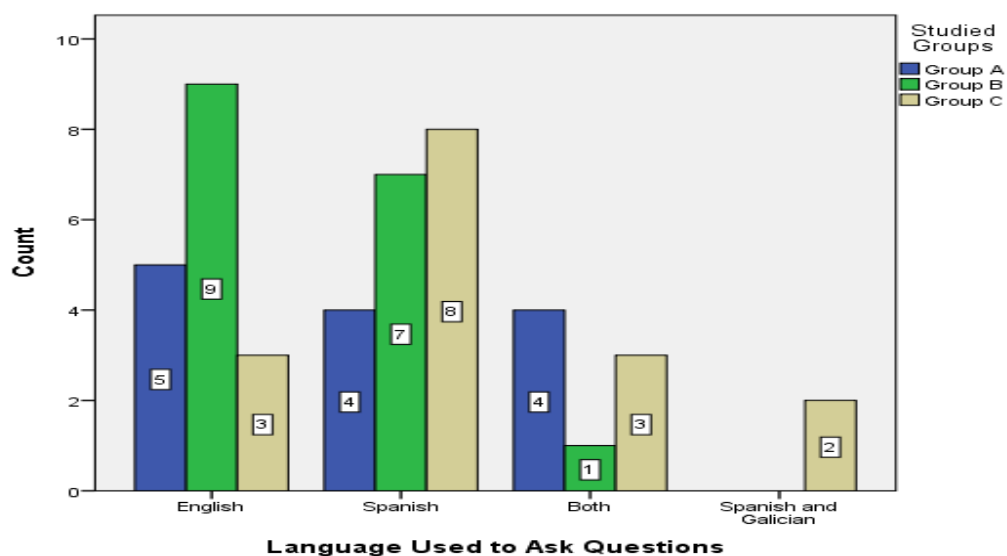


Figure 39: Language Used to Ask Questions.

### Language Used in Group Activities

As it has been previously mentioned, teenagers are often influenced by their peers and ‘learning among peers’ is a crucial issue which needs to be considered in secondary schooling. Furthermore, cooperative and collaborative learning have become key elements in the last decades where methodologies such as PBL (*Project Based Learning*) and CBI (*Content Based Instruction*) have been built upon these ideas. Therefore, group work has become a key factor concerning classroom dynamics. In this case the language used in group activities in CLIL should be considered. Overall, results point towards Spanish as the

language chosen by students during group activities (90,6%) in contrast to those who chose English (5,7%) or both languages (3,8%) while no students chose Galician. These data are not surprising as students use the MT when speaking to each other –though they did use English with their classmates some time (see Chapter 6.3)–, probably due to the fact they are used to speak in Spanish among them and the use of the L1 is more natural to them.

Despite the fact that Spanish is the language used by 90,6% of students, some points need to be made in regards to the three groups. As it can be seen on the graph below, students from Group B (N=3) were the only ones to report having spoken in English with their classmates during group activities and only students from Group A (N=2) stated to use English and Spanish in this case. Although these numbers are not highly significant to the whole analysis, it cannot go unnoticed how once again Group B and Group A seem to use English more extensively than Group C much like in the previous analysed items.

**Language Used in Group Activities**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Spanish	48	90,6	90,6	90,6
	English	3	5,7	5,7	96,2
	English & Spanish	2	3,8	3,8	100,0
	Total	53	100,0	100,0	

Table 34: Language Used in Group Activities.

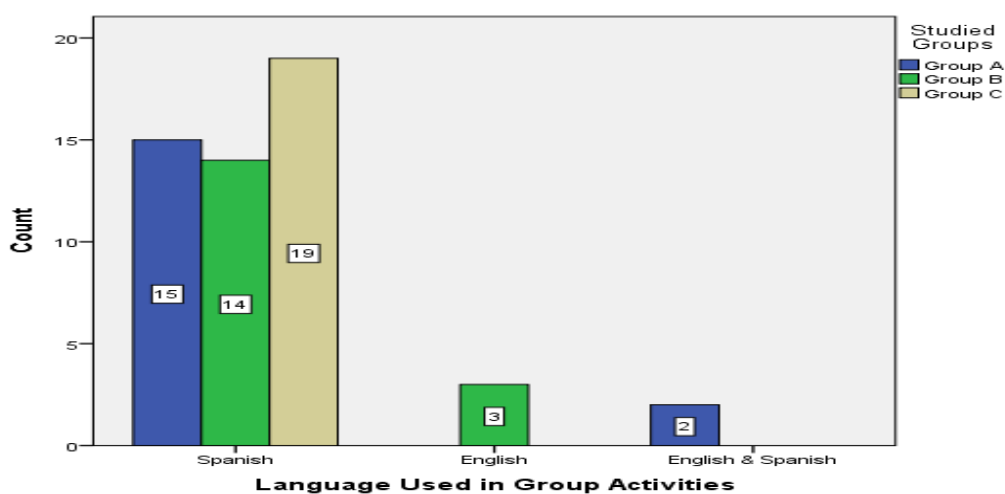


Figure 40: Language Used in Group Activities.

### *Language Used in the Didactic Materials*

Although all the materials which were provided to students during this didactic unit were in English (see Appendix F: Classroom Materials), students were asked to mark down the language in which these were written for the sake of transparency in the data gathering process. Surprisingly, 34,0% (34,6% as valid percent) of students ticked Spanish as the language most commonly found in the didactic materials and 3,8% marked down Galician as the language used in the materials. After having a look at the data, there are two possible reasons for these numbers: 1) students misunderstood the question and chose the language in which they answered the exercises and tasks; or 2) students may have not paid much attention to the wording of the item and answered based on their language experiences due to the fact that the previous two items were similar in appearance to this one and they asked about students' language use.

As far as the three groups are concerned, some frequency is found in the 'Spanish' and 'English' variable for the three of them; the highest frequency for English belongs to Group B (N=13) while the highest frequency for Spanish is represented in the graph in the Group C column (N=9). Concerning Group B, ten students (N=10) chose the option of 'English' while six students (N=6) ticked 'Spanish'.

**Language Used in the Didactic Materials**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Spanish	18	34,0	34,6	34,6
	Galician	2	3,8	3,8	38,5
	English	32	60,4	61,5	100,0
	Total	52	98,1	100,0	
Missing	System	1	1,9		
Total		53	100,0		

Table 35: Language Used in the Didactic Materials.



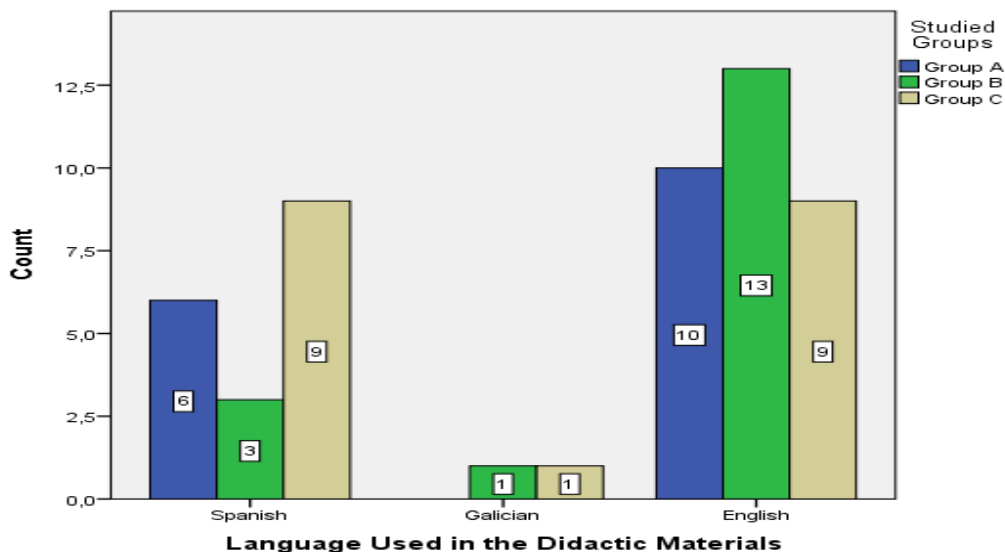


Figure 41: Language Used in the Didactic Materials.

### *Opinion on the Textbook*

Even though other didactic materials were used during the lessons, the textbook was a constant in the CLIL classroom. Although the book was published for the first time in the 1980's in the US, it has been used since the CLIL sections for Physics and Chemistry were implemented. As it can be seen in the teacher's interview (Chapter 6.2), the CLIL teacher is quite happy with the textbook, but it is necessary to know students' opinion on this issue in order to consider whether this could be an element which needs improvement. In order to do so, students were asked to rate the statement 'I like the textbook' following the Likert scale. The results point towards a high number of students who are undecided on this issue (34,0%; 34,6% as valid percent) followed by students who disagree on the statement (22,6%; 23,1% as valid percent), those who agree (18,9%; 19,2% as valid percent), those who strongly disagree (15,1%; 15,4% as valid percent) and those who strongly agree (7,5%; 7,7% as valid percent). Overall, these numbers represent a tendency in students' opinion towards indecision on the matter at hand and disagreement –the joined percentages for 'disagree' and 'strongly disagree' (37,7%; 38,5% as valid percent) are higher than the percentage of participants who 'agree' or 'strongly agree' with the statement (26,4%; 26,7% as valid percent).

These results need to be contextualised within the data gathered from the three groups. As it can be seen on the graph below, Group C stands out again due to their disagreement with the statement (N=9) while Group B seems to be the group who has the highest regard for the textbook (N=6, 'agree'). In general terms, 'undecided' was the option with the highest frequencies for Group A and B (N=7) which is linked to the overall percentages of the table below. Furthermore, it could be argued that the overall high percentage in the 'disagree' option is the result of the data provided particularly by Group C, so the three groups' idiosyncrasies should be considered in the big picture.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	4	7,5	7,7	7,7
	Agree	10	18,9	19,2	26,9
	Undecided	18	34,0	34,6	61,5
	Disagree	12	22,6	23,1	84,6
	Strongly disagree	8	15,1	15,4	100,0
	Total	52	98,1	100,0	
Missing	System	1	1,9		
Total		53	100,0		

Table 36: Level of Satisfaction with the Textbook.

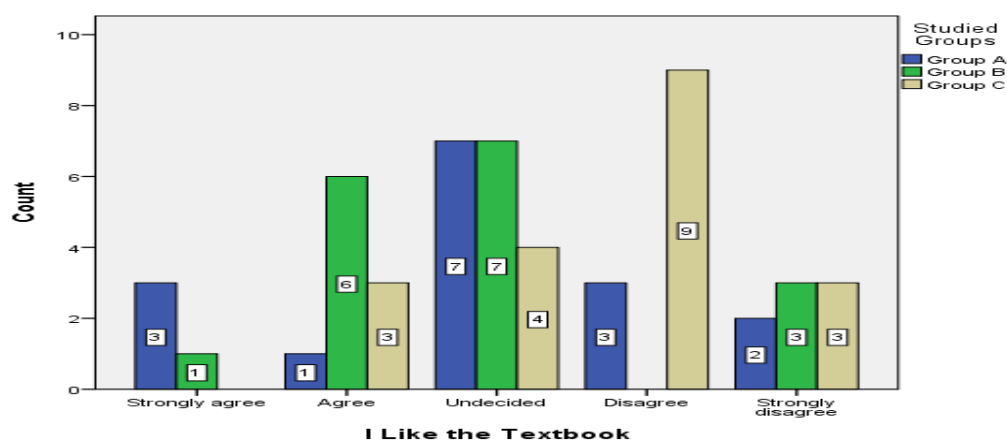


Figure 42: Students' Opinion on the Textbook.

### Using Other Materials

Other materials such as handouts were used in the CLIL lessons to complete the textbook and cater to the contents and learning standards of the Galician curriculum as well as to provide students with a practical uptake of the content subject (e.g. problem-solution exercises). As these resources are created by the teacher in order to answer the Galician curriculum and to enrich students' learning process, it is important for them to use them. According to the questionnaire results, 69,8% of students (72,5% as valid percent) use these additional materials while 26,4% of them (27,5%) do not. Overall, these numbers are positive as they reflect a high use of additional materials which can be related to a strong interest in the contents of the subject (intrinsic motivation) or interest to do well in the exams (external motivation). In terms of group differences, there are no significant differences among the three groups.

#### I Use Other Materials Provided by the Teacher

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	True	37	69,8	72,5	72,5
	False	14	26,4	27,5	100,0
	Total	51	96,2	100,0	
Missing	System	2	3,8		
Total		53	100,0		

Table 37: Using Other Materials.

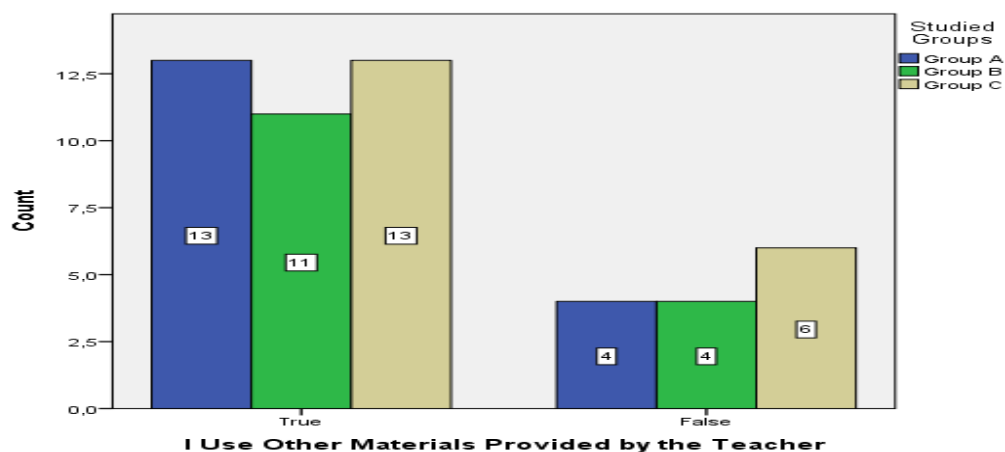


Figure 43: Using Other Materials Provided by the Teacher.

*Content-Based Activities and English*

A multiple choice item was presented to students with all the different activities and exercises they had to do or perform during the didactic unit. They were asked to choose the activity in which they felt they learned more English. After having a look at the results of the table, it is clear the ‘Check and Apply’ exercises of the textbook (e.g. fill-in-the-blanks, T/F exercises, classifying into types of solutions) is the option with the highest percentage of all the activities by far (34,0%); this may be related to the fact that the type of English used in these exercises is strongly linked to content vocabulary; thus, students think learning English in the CLIL section is linked to learning vocabulary due to the fact that this is explicitly learned.

The second highest percentage also belongs to the textbook activities, in this case, ‘Explain, Define, Contrast and Analyze’ exercises (22,6%). These exercises had in common their open-ended answer nature; therefore, students had to write down more than a couple words (in contrast to the aforementioned ‘Check and Apply’ activities). This would allow students to further expand on their English by writing down longer pieces of information English; thus, increasing their output in the FL.

Furthermore, the reading comprehension on ‘Fractional distillation of petroleum’ (given as homework) was chosen by 11,3% of participants as the activity in which they learned more English. This may be related to the high level of input a reading comprehension task carries: students need to deal with a somewhat long text and understand it so to carry out the activity; therefore, their English level is put up to test and they may have to spend more time working on their English than in the previous exercises.

Unsurprisingly, the lowest percentages are found in the practical activities: ‘Lab Experiment 2’ (7,5%), ‘Lab Experiment 1’ (5,7%), ‘Lab Experiment 3’ (1,9%) and ‘Solutions-Concentration’ problems (1,9%). These low percentages are probably due to the

fact that not much English input was necessary to carry out the calculations in the experiments so students felt not much English was learned doing these tasks.

However, observing the answers for each group, it is clear that those few who chose the lab experiments were from Group C. A possible explanation for this is that Group C students did not read the statement attentively and chose the activity in which they learned the most about content subject rather than the activity in which they learned most English. This could be further reinforced by the fact that the majority of Group A (N=12) did not answer this item as the statement requested (they chose more than one activity); therefore, the information gathered from this item should be considered taking into account these circumstances.

**Activity Which Helped Me Learn More English**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	12	22,6	22,6	22,6
Explain, Define, Contrast and Analyze Questions	8	15,1	15,1	37,7
Check and Apply Exercises	18	34,0	34,0	71,7
Solutions-Concentration Problems	1	1,9	1,9	73,6
Fractional distillation of petroleum: Reading Comprehension	6	11,3	11,3	84,9
Lab experiment 1: make a solution	3	5,7	5,7	90,6
Lab experiment 2: separate components from an heterogeneous mixture	4	7,5	7,5	98,1
Lab experiment 3: separate water and oil	1	1,9	1,9	100,0
Total	53	100,0	100,0	

Table 38: Activity in Which Students Learned More English.

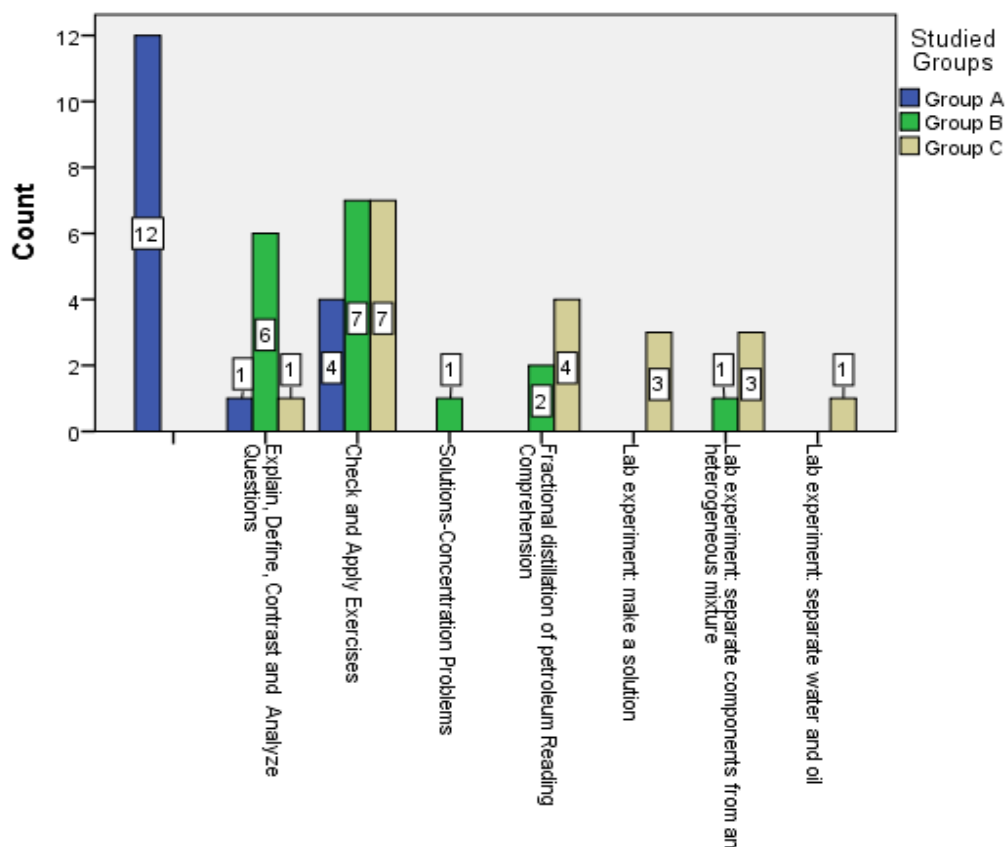


Figure 44: Activity in Which Students Learned More English.

### *Level of English Needed for the Previous Activity*

Taking into account the different levels of English proficiency which may be encountered in the CLIL groups, it was necessary to find out what students thought about the language requirements to complete the activity in which they learned most English. According to the figures, the majority of students believed an intermediate<sup>6</sup> level of English was necessary to carry out said activity (75,5%) while 15,1% believed a high level was necessary in contrast to 9,4% of students who thought having a low level of English would suffice. Bearing in mind that a low challenging activity would lead to boredom and a high challenging activity may lead to bouts of frustration, it is positive from a motivational perspective that most students believed an intermediate level of English was necessary to

<sup>6</sup> Note here this does not refer to the *CEFR* classification of language levels, but to the level of difficulty within students' own level of proficiency in English.

carry out the activity. This leads to conclude that the use of English in the CLIL lesson may be a challenging but also engaging element for CLIL students. Furthermore, it should be pointed out that no significant differences were found among the three studied groups in regards to the answers given for this item.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low	5	9,4	9,4	9,4
	Intermediate	40	75,5	75,5	84,9
	High	8	15,1	15,1	100,0
	Total	53	100,0	100,0	

Table 39: Level of English Needed for the Previous Activity.

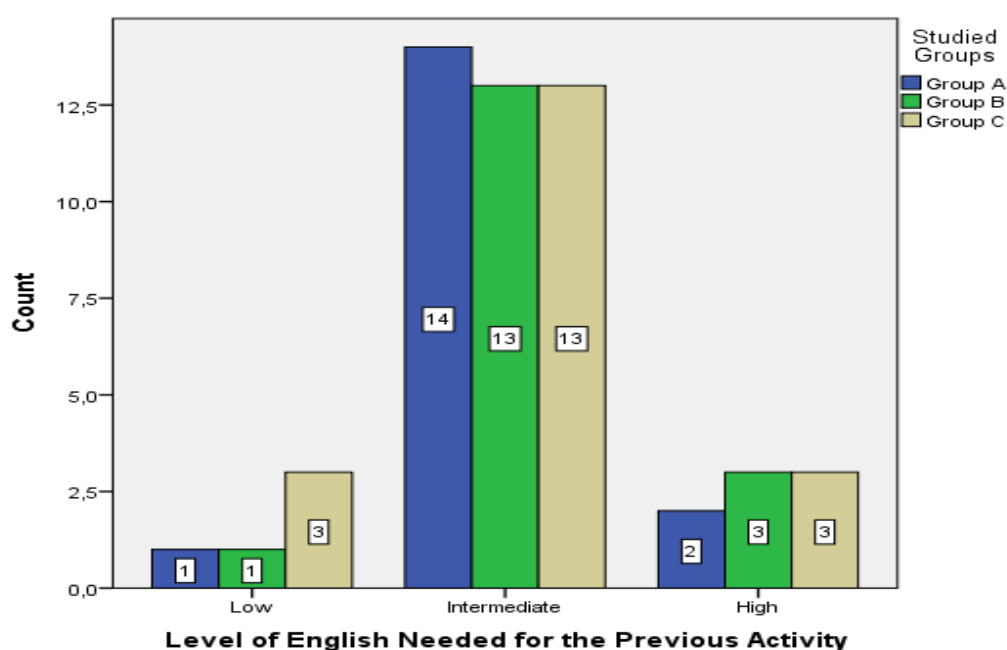


Figure 45: Level of English Needed for the Previous Activity.

### *Level of Difficulty for the Previous Activity*

As it has been pointed out, the level of difficulty when carrying out an activity is an important element to consider in regards to affective factors. In regards to the level of difficulty in the previous chosen activity, 45,3% of students managed to deal with the activity with some difficulty, 41,5% of them did not find any difficulty at all and only 13,2% of

participants completed the activity with difficulty. Therefore, it could be concluded that most students believe the no difficulty or some difficulty is found when tackling the activity in which they have learned most English.

In regards to the three studied groups, it is significant that only members from Group A and Group C handled this activity ‘With difficulty’ (N=3 and N=4 respectively). The fact that no student from Group B chose this variable could be linked to the fact that they are academically better (according to the CLIL teacher) than the other two groups. Moreover, previous analysis has shown that, overall, students from this group do not think the language of instruction (English) is a detrimental factor in the acquisition of content-based knowledge (Physics and Chemistry). On the other hand, similar figures are found concerning the ‘Some difficulty’ and ‘No difficulty’ variables in the three studied groups.

#### I Managed to Complete the Previous Activity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	With difficulty	7	13,2	13,2	13,2
	Some difficulty	24	45,3	45,3	58,5
	No difficulty	22	41,5	41,5	100,0
	Total	53	100,0	100,0	

Table 40: Level of Difficulty in the Previous Activity.

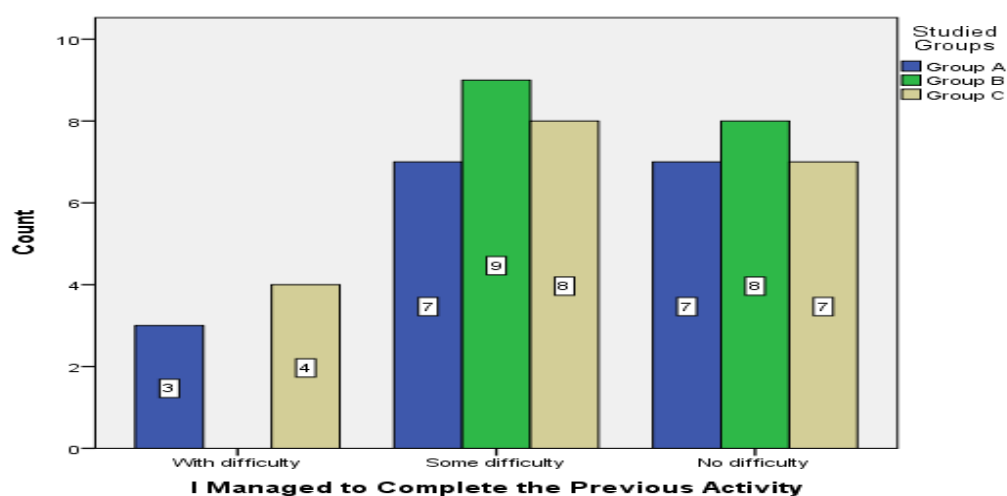


Figure 46: Level of Difficulty in the Previous Activity.



#### 6.1.4. Goals

The aim of this subheading is to provide information on students' perspectives on some issues such as the importance of English in their future job prospects, whether students think learning and speaking English is important or their perceived advantages and disadvantages of the CLIL section. The data gathered by these items provides information on possible academic goals (Covington, 2000). In order to do so, several Likert scale items were present in the questionnaire.

##### *Knowledge of English as a Significant Factor in Future Job Prospects*

The status of English as a lingua franca is an undisputable phenomenon. However, this does not mean students would feel English will be necessary in their future jobs so their input on this issue should be asked rather than make an overall assumption. According to the gathered data, most students strongly agree (77,4%; 80,4% as valid percent) that knowing English will help them in their future jobs, 9,4% (9,8%) of students agree with this statement, 7,5% (7,8% as valid percent) are undecided and only 1,9% (2,0%) of participants disagree. Besides it cannot go unnoticed no participant chose the 'strongly disagree' variable. These numbers support the idea that students perceive learning English as a tool "to attain some separable outcome" (Deci & Ryan, 2000, p. 71), in this case, getting a job; thus, extrinsic motivation (Deci & Ryan, 2000) and instrumental orientation (Gardner & Lambert, 1972) can be found in the analysis of this item in regards to students' attitudes towards English.

#### **Knowing English Will Help Me Find a Good Job**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	41	77,4	80,4	80,4
	Agree	5	9,4	9,8	90,2
	Undecided	4	7,5	7,8	98,0
	Disagree	1	1,9	2,0	100,0
	Total	51	96,2	100,0	
Missing	System	2	3,8		
Total		53	100,0		

Table 41: Knowledge of English so to Find a Good Job.

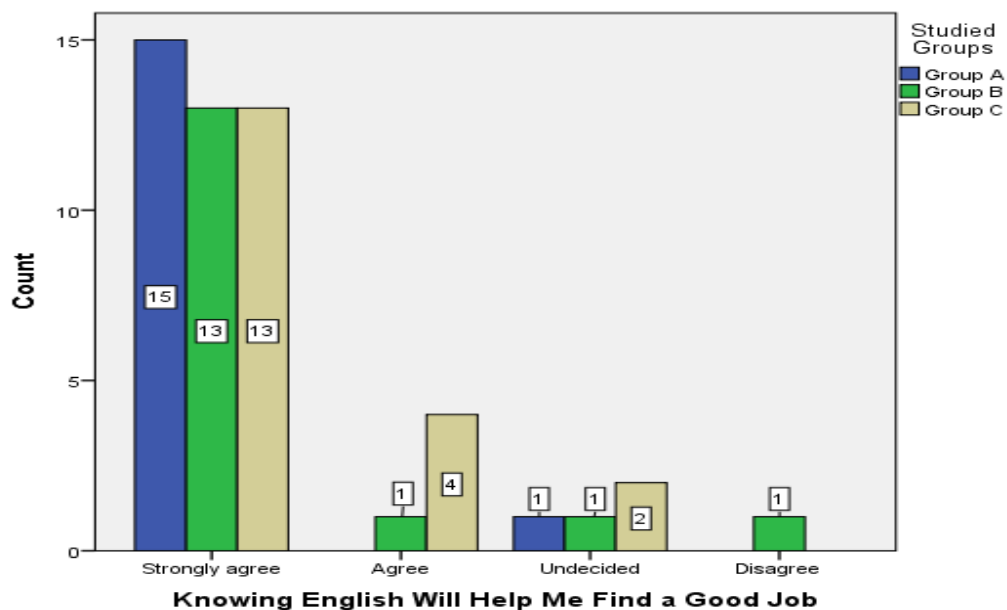


Figure 47: Knowledge of English so to Find a Good Job.

#### *Awareness on the Current Impact of English in Our World*

Although the statement proposed in this question did not specify on the reasons why knowing English may be important in our current world, students answered based on their implicit knowledge on the current linguistic situation in which English is the lingua franca. Similarly to the previous item, 77,4% of students (78,8% as valid percent) strongly agreed on the presented statement ('It is necessary to know English in our current world'). Furthermore, 13,2% (13,5% as valid percent) agreed and 5,7% (5,8% as valid percent) chose the 'Undecided' variable. Moreover, 1,9% (2,0%) of participants disagree and it cannot go unnoticed no participant chose the 'strongly disagree' variable. These numbers are further proof of the extrinsic value students place on knowing English in the current linguistic context.

### It is Necessary to Know English in Our Current World

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	41	77,4	78,8	78,8
	Agree	7	13,2	13,5	92,3
	Undecided	3	5,7	5,8	98,1
	Disagree	1	1,9	1,9	100,0
	Total	52	98,1	100,0	
Missing	System	1	1,9		
Total		53	100,0		

Table 42: Need to Know English in Our Current World.

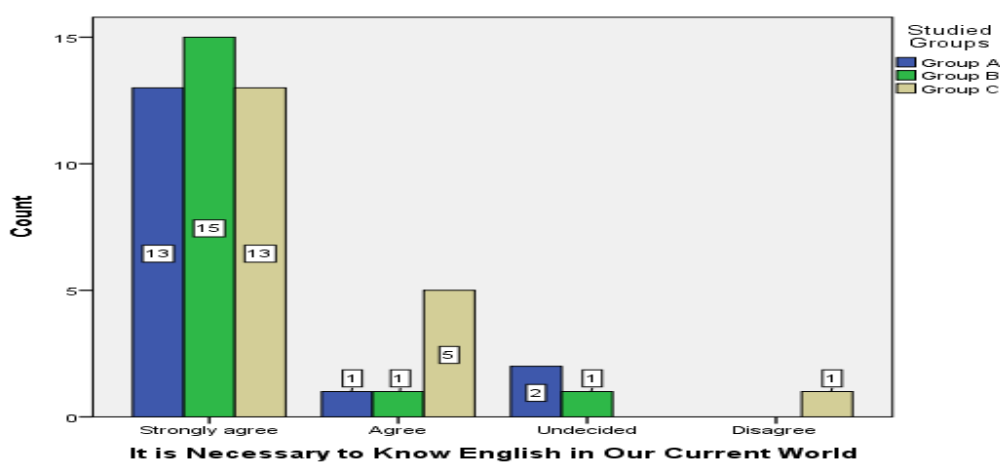


Figure 48: Need to Know English in Our Current World.

### *CLIL Physics and Chemistry as an Advantageous Factor for Future Academic and/or Professional Endeavours*

After analysing students' perceptions of the English language, it is necessary to dig deeper and specify on their opinions of CLIL in Physics and Chemistry. When asked whether they think the CLIL section would be advantageous in their future as students and/or workers, 24,5% (25,5% as valid percent) stated they strongly agree with this, 22,6% (23,5% as valid percent) agreed, 13,2% (13,7% as valid percent) were undecided, 15,1% (15,7% as valid percent) disagreed with the statement and 20,8% (21,6% as valid percent) strongly disagreed. Compared to the previous analysed items (students' perspective of English), these numbers

present a more heterogeneous panorama in regards to the extent students feel the CLIL section would be advantageous in their future.

However, these figures need to be contextualised within the three studied groups: as it can be observed in the graph, Group C stands out in the ‘strongly disagree’ variable (N=8) as does Group B in the ‘disagree’ variable (N=6). The fact that these two groups stand out in these specific variables (in contrast to the other somewhat homogeneous frequencies) may lead to think these two groups have a significant percentage of students who do not see extrinsic value to the CLIL section; in fact, the high frequency of Group C could be linked to the low level of satisfaction the group feel in regards to the CLIL section, though this does not explain Group B’s number on the ‘disagree’ variable.

#### **Learning Physics and Chemistry in English Will Give Me Advantages as Student/Worker**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	13	24,5	25,5	25,5
	Agree	12	22,6	23,5	49,0
	Undecided	7	13,2	13,7	62,7
	Disagree	8	15,1	15,7	78,4
	Strongly disagree	11	20,8	21,6	100,0
	Total	51	96,2	100,0	
Missing	System	2	3,8		
Total		53	100,0		

Table 43: Learning Physics and Chemistry in English Will Give Students Advantages in their Future as Students/Workers.

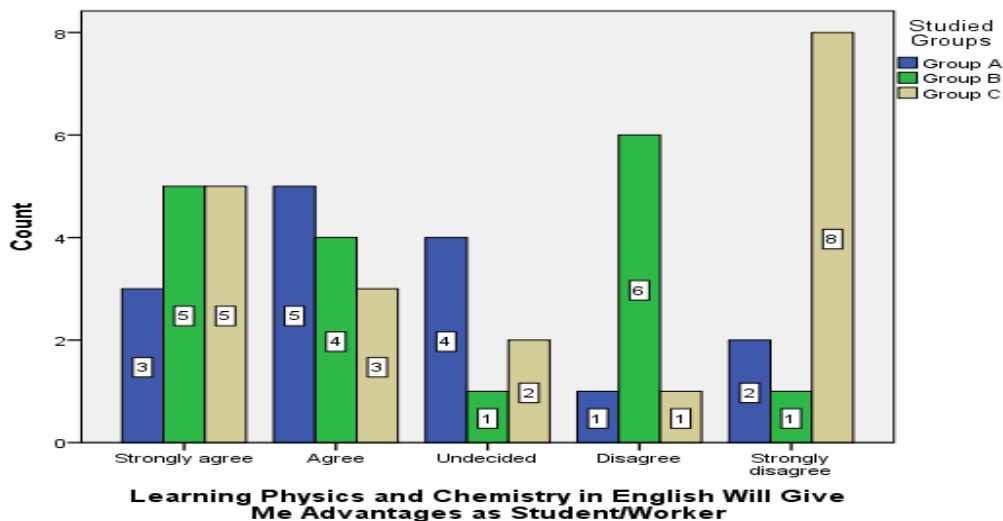


Figure 49: Learning Physics and Chemistry in English Will Give Students Advantages in Their Future as Students/Workers.

#### *English in Physics and Chemistry as a Way to Improve Students' Spoken English*

Speaking is one of the two productive skills the *CEFR* (2001) defines in regards to language skills. Due to its productive nature as well as its practical aspects (e.g. not much preparation time in dialogues), speaking may be considered one of the most difficult skills to achieve. It cannot go unnoticed that students' constant contact with a language would improve said language proficiency and their speaking skills would be further developed. Thus, constant contact with English thanks to the CLIL section may improve students' spoken English; however, students' opinions on this issue may differ. When asked whether they think their spoken English has improved thanks to the English used in CLIL lessons, 32,1% (32,7% as valid percent) were undecided, 20,8% (21,2% as valid percent) agreed with the statement, 17% (17,3% as valid percent) disagreed, 15,1% (15,4% as valid percent) strongly agreed and 13,2% (13,5% as valid percent) strongly disagreed with the statement.

Overall, these numbers show a tendency towards indecision ('Undecided') on this issue while there are no significant differences on the other percentages. However, some differences are found concerning the three studied groups: Group C stands out in the

‘Strongly disagree’ (N=4) and ‘Disagree’ (N=5) figures, especially if compared to the figures from the other two groups in these variables (see bar graph below). Overall, Group B seems to be the one with the highest figures in the ‘Agree’ (N=6) and ‘Strongly disagree’ (N=4) variables followed by the figures from Group A (‘Agree’: N=4; ‘Undecided’: N=6). Overall, it seems there is a tendency towards the ‘negative’ variables (disagree, strongly disagree) in Group C which may be understood as proof of this group’s negative attitude towards the CLIL section, while a positive attitude towards the advantages in CLIL (in this case, spoken English) could be read off from the figures in Group B and, to a lesser extent, the frequencies in Group A. These data could answer to a strong sense of academic achievement in Group B and A related to academic goals (Covington, 2000): speaking English –an important value in itself– and improving it by means of the CLIL methodology would lead to better academic results; thus, the learning goals are a force in students’ performance and motivation.

#### **My Spoken English is Better Thanks to the English Used in Physics and Chemistry**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	8	15,1	15,4	15,4
	Agree	11	20,8	21,2	36,5
	Undecided	17	32,1	32,7	69,2
	Disagree	9	17,0	17,3	86,5
	Strongly disagree	7	13,2	13,5	100,0
	Total	52	98,1	100,0	
Missing	System	1	1,9		
Total		53	100,0		

Table 44: Improved Spoken English Thanks to the English Used in Physics and Chemistry.

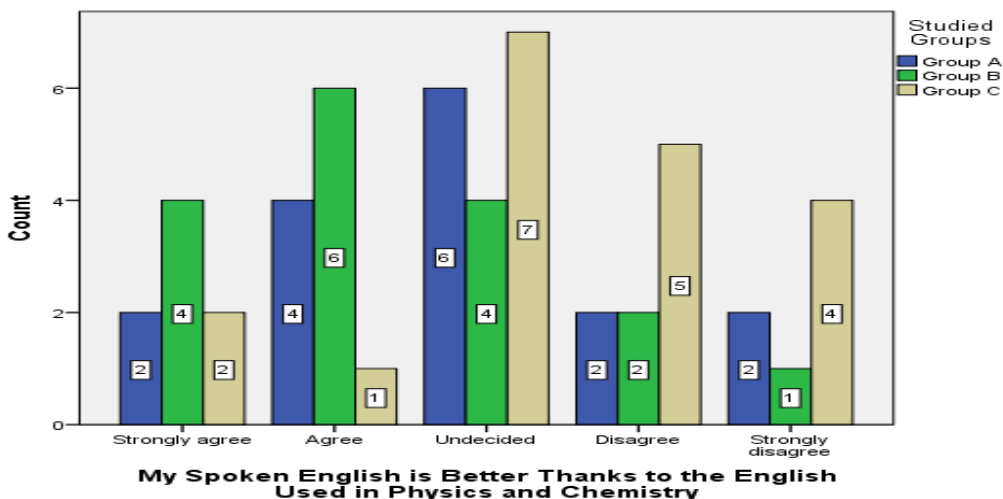


Figure 50: Improved Spoken English Thanks to the English Used in Physics and Chemistry.

*Advantages of the CLIL Section*

Although the advantages of the CLIL section have been widely researched (see Chapter 4), students’ perceptions and opinions may not agree on the overall academic research done so far. Opinions are based in both objective and subjective reasons and, although objective reasoning should be one of the pillars of academic research, students’ objective and subjective-based perceptions on CLIL should be also considered. In this case, most students (77,4%) affirm the CLIL section has advantages while 22,6% answered negatively to this question. These overall positive results are found in a homogeneous way in the three studied groups (see bar graph below) which may lead to conclude that despite the different group profiles, students are aware (consciously or unconsciously) of the advantages the CLIL section may provide.

**Does the CLIL section have advantages?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	12	22,6	22,6	22,6
	Yes	41	77,4	77,4	100,0
	Total	53	100,0	100,0	

Table 45: Advantages of the CLIL Section.

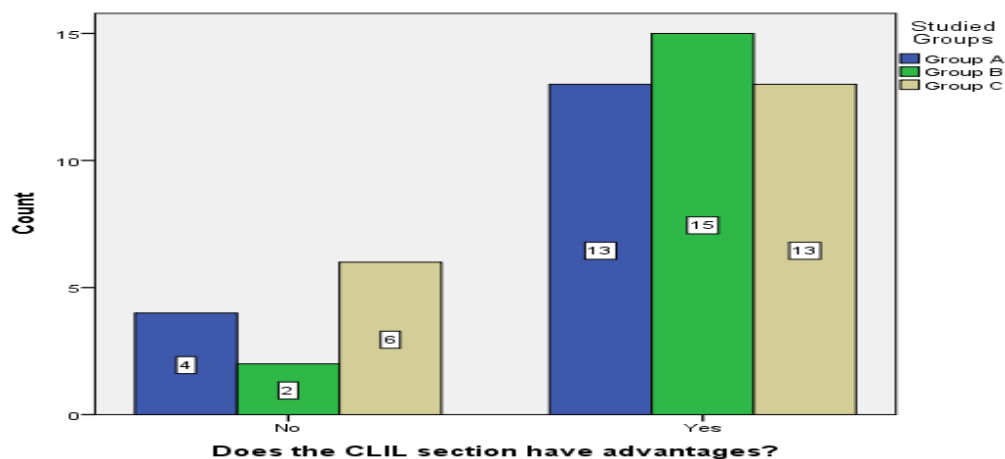


Figure 51: Advantages of the CLIL Section.

Concerning said advantages, students' answers on this issue are to be divided into three different categories: 1) Improving/Practising English; 2) Learning Content; and 3) Assessment. However, it is clear that, generally speaking, students perceive the advantages of the CLIL section within the first division (see 'Advantages of the CLIL Section', Appendix E: Chapter 6). In regards to the advantages related to their English skills students point out several issues:

- Practicing their English in the CLIL section helps them to improve their English skills.
- Spoken English is improved thanks to constant contact with it. Furthermore, one student (S12A) also points out feeling less embarrassed when speaking English due to the constant use of this in the CLIL section and fluency is a key word often repeated.
- Vocabulary is the most common element which is said to improve thanks to the CLIL section. In regards to vocabulary, students state to learn new and specific words in English thanks to the use of the FL in Physics and Chemistry.
- Pronunciation is the second most common element to be reported to improve thanks to the CLIL section: this is in direct contrast to research done so far which



point out pronunciation is one of the unaffected language areas in CLIL (Dalton-Puffer, 2008; Nieto Moreno, 2016). This may be related to the fact the CLIL teacher emphasises pronunciation of significant elements in his teaching practice.

- Although they have a lower frequency, other interesting issues are also accounted:
  - English helps students to study the content (S9B & S16B).
  - Receptive skills such as reading and listening are improved (S3B).
  - Looking up further information on the topic due to the extra challenge of the language of instruction is regarded positively (S9A).

Furthermore, some students (N=4) point out learning content is easier in the CLIL section (S2B & S6B) while some say they learn more (S1C & S5C); the latter are supposed to learn more than in the non-CLIL section, though the wording is ambiguous. Also some students (N=2) highlight the ‘easiness’ of the exams in the CLIL sections as one of the advantages. This uptake on the content and the exams is also reflected on the CLIL teacher’s interview (Chapter 6.2): he states the content is somewhat simplified so to bear in mind possible language-related difficulties.

#### *Disadvantages of the CLIL Section*

Despite the fact that the term ‘disadvantage’ has a negative connotation, it cannot go unnoticed the significant value of finding both advantages and disadvantages has on students’ critical thinking skills. Therefore, the fact that 66,0% of students (67,3% as valid percent) find disadvantages in the CLIL section –in contrast to 32,1% of students (32,7% as valid percent) who did not– should not be looked on as concrete evidence of students’ negative opinion of the CLIL section, but as proof of students’ critical thinking and their awareness on possible shortcomings of the CLIL section.

Overall, it could be said the percentages of this item are somewhat similar to the percentages of the previous analysed question (advantages of the CLIL section: 77,4%

answered ‘yes’, while 22,6% answered negatively); thus, it seems a high number of students believe the CLIL section has both advantages and disadvantages. This homogeneity is also present in the answered provided by the three different groups in regards to this item (see bar graph below).

### Does the CLIL section have disadvantages?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	17	32,1	32,7	32,7
	Yes	35	66,0	67,3	100,0
	Total	52	98,1	100,0	
Missing	System	1	1,9		
Total		53	100,0		

Table 46: Disadvantages of the CLIL Section.

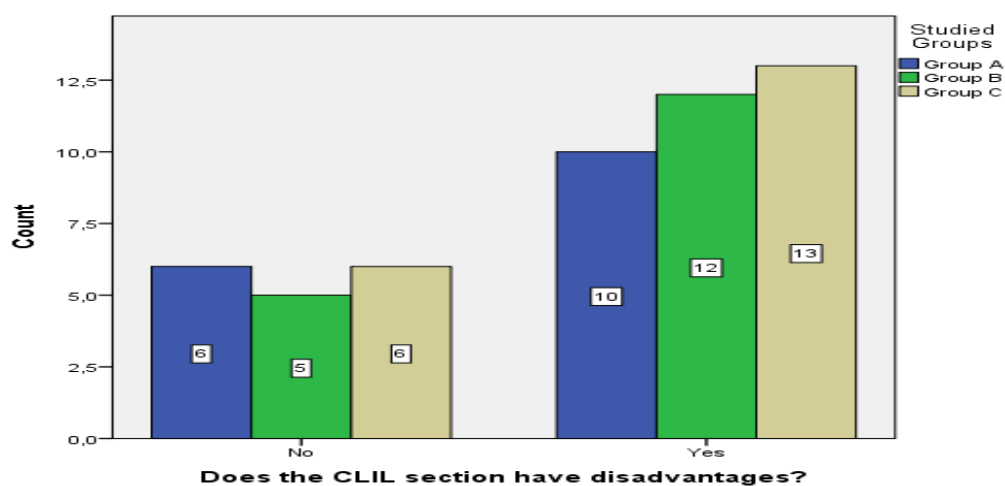


Figure 52: Disadvantages of the CLIL Section.

Concerning the disadvantages students point out, these have been divided into three categories: 1) Language-related Concerns; 2) Level of Difficulty; and 3) Other Issues (see ‘Disadvantages of the CLIL Section’, Appendix E: Chapter 6). The first two categories are equal regarding the number of students who pointed out some disadvantages regarding English (N=16) and the level of difficulty (N=16). In regards to the first category some issues should be accounted:

- Students stated that the content subject might be more difficult for those students who do not have a good level of English. Interestingly, only one student (S5A) reported not being good in English (in this item) while a higher number of students (N=4) wrote the only disadvantage they found was in regards to other people and their hypothetical level of English, though they did not report having any language-related shortcoming themselves (S7A, S3B, S16B & S2C). Therefore, according to the answers provided by the students, their hypothesis on the possible disadvantage of English to other classmates may not be true.
- In regards to language areas, students emphasised not knowing specific vocabulary as one of the disadvantages of the CLIL section (S13A, S7B, S13B & S15B). It is interesting to see that the same issue (learning new and specific vocabulary) has been considered a disadvantage by some students and an advantage by others.
- Spanish is also mentioned as the easier option compared to English (S8A) and as the language in which students may internalise the content better (S11B), though it is present in a low frequency (N=2).

Also within the first category (Language-related Concerns), some issues on the level of difficulty of the CLIL sections are found: some students (S1B, S10B) believe the level of difficulty of the Physics and Chemistry contents is low due to the use of English in the classroom. This concern (not learning enough Physics and Chemistry) is repeated in the 'Level of Difficulty' category (S2B) without specifying the reason behind this. As it has been previously mentioned, the level of difficulty could make or break a lesson; providing students with a low level of input may make them be bored while a too high level may make them feel frustrated or even anxious. In regards to the disadvantages in the second category, most of the stated disadvantages are related to students' perceived high levels of difficulty in the subject

which vary from ‘a bit/somewhat complicated’ (e.g. S9B, S6C & S10C) ‘sometimes complicated and/or some problems’ (S13C & S19C), ‘complicated/difficult’ (S3A, S4C, S5C & S17C) and ‘very difficult/not understanding anything’ (S8C, S9C, S16C & S18C). It should also be considered that students’ concerns were different in the three groups: while Group A and B presented a higher number of disadvantages in regards the language, Group C focused their concerns in the level of difficulty of the content subject. This may be a reflection of students’ overall concerns with the subject (Physics and Chemistry) rather than the specific CLIL section; thus, Group C feels the difficulties in the CLIL group rely on the content while Group A and B pay more attention to possible (and sometimes hypothetical) language difficulties which may arise in the Physics and Chemistry lessons.

## **6.2. Teacher’s Interview**

The teacher’s interview was carried out in the Physics and Chemistry classroom during a free period. The purpose behind this interview was to collect the Physics and Chemistry teacher’s opinion on several CLIL and classroom matters bearing in mind that “[i]nterviewing provides a way of generating empirical data about the social world by asking people to talk about their lives. In this respect, interviews are special forms of conversation” (Holstein & Gubrium, 2004, pp. 140-141). However, it needs to be pointed out that the data gathered during the interview may not necessarily provide an accurate account of the reality, but it does provide information of the interviewee’s interpretation of the reality:

Research cannot provide the mirror reflection of the social world that positivists strive for, but it may provide access to the meanings people attribute to their experiences and social worlds. While the interview is itself a symbolic interaction, this does not discount the possibility that knowledge of the social world beyond the interaction can be obtained. In fact, it is on their interactive components (rather than trying to control and reduce them), that ‘intersubjective depth’ and ‘deep-mutual understanding’ can be

achieved (and with these, the achievement of social worlds). (Miller & Glassner, 1997, p. 100)

Even though the interview is of a structured nature (questions were planned beforehand), it was necessary to ask some follow-up questions for two reasons: a) the interviewee did not fully understand or answer the question, and b) to further elaborate on something the interviewee said. These questions follow the interaction principle in an interview which would not have been possible passing a questionnaire; the social world (in this case, the classroom) is constructed by means of interaction between the interviewer and interviewee.

In order to understand the classroom's dynamic from the teacher's point of view and to triangulate this information with other qualitative (classroom observation) and quantitative data (questionnaires), the interview is divided into three categories:

- Teaching Formation: professional development, language proficiency, etc.
- Opinion on CLIL: theoretical aspects, hypothetical cases, etc.
- Classroom Practice: methodological aspects, language use, etc.

#### Teaching Formation

This category provides information about the CLIL teacher's profile in terms of professional development (both CLIL and non-CLIL) as well as his relationship with the foreign language (English) which may shed some light on his CLIL experience and perceptions.

1. How long have you been a teacher in the public service?
--

13 years [14 years in the academic year 2017-2018]
--

The fact that this teacher has been part of the public service for an extended period of time allows to hypothesise he has seen numerous changes in terms of educational laws which

have characterised the educational realm in the last years (see Chapter 3.2). Therefore, it could be said that his experience may provide him with a broader and diachronic perspective of the educational panorama in Galicia.

2. Which subjects have you taught?
------------------------------------

First, Physics and Chemistry and also I have taught Mathematics many years ago and Physics in 2 <sup>nd</sup> Bachillerato. Nowadays, I teach Physics and that's all; Mathematics, Physics and Chemistry and Physics.
---

Overall, the CLIL teacher is specialised in Physics, but he has taught other scientific subjects such as Mathematics. He differentiates Physics (2<sup>o</sup> Bachillerato) from Physics and Chemistry (ESO); however, he states that he only teaches Physics at the moment, but he also teaches Physics and Chemistry (the subject studied in this doctoral dissertation). He may have specified that he teaches “Physics and that’s all” to make clear he does not teach Mathematics at the moment.

3. Which subjects have you taught in English and to which academic courses?
---

Physics and Chemistry in 2 <sup>nd</sup> ESO and 3 <sup>rd</sup> ESO.
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It should be pointed out that the teacher has taught using the CLIL methodology in the first cycle of secondary education. Therefore, his practical CLIL experience relies on its implementation among ‘young’ learners. This could reflect on the concepts of TTT (Teacher Talking Time) and STT (Student Talking Time) as TTT is greater in low academic levels.

4. How long have you taught in the bilingual sections?
--

In bilingual sections I was teaching for three years and in this high-school [a plurilingual one] three years. In total six years. [As this interview was carried out in 2017, the total number of years in 2018 would be seven. Also the teacher has taught
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in English for four years in the studied high-school]
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The teacher has taught Physics and Chemistry in different high schools. First, he taught in a bilingual section in a bilingual high-school for three years and the studied high-school (a plurilingual centre) is his second experience with the CLIL methodology. Taking into account that the academic year 2017-2018 is the seventh year he participates in the CLIL sections, it is clear that he has been part of the bilingual programme in Galicia since its beginnings (*Orde*, 2011). It could be argued that his continuation in the programme since its early stages is proof of its commitment to it and a factor to consider concerning the teacher's motivation (to be addressed later)

5. What is your level of English? Do you have any certificate? If so, the date?
---

B2, the official level from the School of Languages (EOI), the old planning (5 years). 10 years ago, more or less.
---

The teacher's language certificate complies with the *Orde* (2011) which states the CLIL teacher needs to have a B2 certificate in the language of instruction (2011, p. 10351). He points out that he got it after 5 years (the School of Languages' old planning) a decade ago. However, it should be pointed out that language certificates are not the only element to be considered in regards to language proficiency –though it is true that language certificates have risen in Spain (Tabuenca-Cuevas, 2016)– and other issues related to this are to be discussed in question 9.

6. Do you have any specific formation on CLIL? Was it useful?
---

Yes, PALE, actual PIALE. Yes, especially my experience in Canada, I was there for three weeks working in a high-school and it was very useful.
--

This question was made with two aims in mind: (1) to find out the teacher's formation on CLIL and its perceived usefulness, and (2) to discover what the CLIL teacher understands as CLIL formation. The teacher commented on becoming part of the programme PALE (currently known as PIALE) which is focused on linguistic training; in this case, said teacher went to work in a Canadian high-school for three weeks thanks to this programme. According to him, the experience was very useful.

7. Do you do something to improve your English or your teaching techniques?

No, I try to prepare my classes previously (more than the normal classes in Spanish) and have a clear idea of the syllabus before the course begins.

*Follow-up question: In what sense do you prepare more the English classes?*

I have all the planning more prepared in these classes and I know what to do at every exact moment, it is freer in the Spanish class and the English class is more fixed.

It is not farfetched to think that the preparation for these lessons (CLIL lessons) would differ from non-CLIL lessons. In regards to this, the teacher states that he prepares these lessons more “than the normal classes in Spanish” probably due to the language requirements and he points out the need to have a clear picture of the syllabus before the beginning of the course.

In order to clarify this need to ‘prepare more’ the teacher states, it was necessary to do a follow-up question so to elicit the information: timing is one of the elements the teacher needs to prepare more as he knows “what to do at every exact moment”, he links this with the fact that he feels less restrained in the Spanish class than in the English class (more restrictive). Again this could be due to the language used as the content-based foreign language needs to be given further thought than the native language.



8. Have you requested any grant or government-funded help for this?
---

Yes, I had a grant for Canada by the <i>Xunta</i> .
---

This funding was for his three-week stay in Canada for the programme PIALE (see question 6 above).

9. Have you taken any refresh courses on foreign language? How frequently?
--

No, but I read in English and I go with a person to talk in English one day per week.
---

As mentioned in question 5, language certificates are not the only elements to be considered in regards to the CLIL teacher's English training. Even though he has not taken any refresh courses on the foreign language or any new language certificates, he has continued to improve his English level in his spare time by reading and going to conversation lessons once per week. Therefore, it cannot go unnoticed that, besides showing the teacher's instrumental motivation (Gardner & Lambert, 1972) towards improving his English (conversation lessons to improve his spoken English), it could be also argued that his answer to this question could be proof of his intrinsic motivation (Deci & Ryan, 2000) towards learning English as his sought contact with English answers to an inner desire of self-improvement.

#### Opinion on CLIL

10. What is your general opinion on the CLIL sections?
--

I think it is very interesting, I have the idea that students are more focused when studying the subject in a foreign language because they have to do two jobs: they have to translate and, at the same time, they have to understand clearly the concepts. You have to do a different work in regards to the normal studies, I think it is interesting for students because I think the concepts are more fixed. On the other
---

hand, you have to know that the subject is simpler than the subject in Spanish because you have more difficulties regarding students' level of English.

Following the same line as other studies, the CLIL teacher's opinion on CLIL is generally positive (Infante, Benvenuto & Lastrucci, 2009; Méndez García, 2014; Pladevall-Ballester, 2015; Pérez Cañado, 2016). He also states some benefits such as students' focus on the content of the subject due to the extra challenge the foreign language represents. Therefore, the teacher perceives some differences in the students' learning process thanks to English such as students internalising subject concepts better than in the 'normal' lessons (non-CLIL lessons) which could be linked to metacognitive issues (see Chapter 4.2). Although the teacher's opinion on CLIL is positive, he is aware of some shortcomings in the CLIL methodology such as the fact that the content is simpler in the CLIL sections due to the difficulties students may find because of the language of instruction.

11. What is your opinion on the *Decree 79/2010 for Pluriilingualism?*

I agree with this situation, we have to educate in context and this is the context here in Galicia, we have this situation and this is the best thing to teach with this real situation we have in the street because now in the rural world English is as important as Galician and Spanish.

The teacher is aware that the sociolinguistic situation of Galicia (a bilingual autonomous community) should be reflected on education and he emphasises the idea of educating in context. Having said that, he also points out the importance of English in Galicia: he specifies that English is as important in the rural world as Spanish and Galician; thus, trying to overcome latent stereotypes in regards to Galician rural areas. To sum up, it could be said that the teacher takes into account the Galician context within the education

realm and he caters for a homogeneous linguistic implementation in the autonomous community.

12. Do you think the *Orde 12 maio 2011* (bilingual sections) and the curriculum-focused educational laws consider significant aspects of CLIL implementation or would you add something?

I think this law is not taking into account the role of the teacher, maybe you need more help in order to teach this kind of classes. The role of the government is to do this law and that's it, they stopped and I think they have to supply help to teachers to teach the subjects like, for example, programmes as PALE: they are very important but it is necessary to have a continuous supply. Everyday life in the classroom is different, very particular about the courses. For example, about material; I can appreciate the lack of these, I could have more materials if I could share this experience with other teachers and the government could be a means to put materials in common with other teachers and to share information in general: this is not the situation nowadays from my point of view.

In regards to his opinion on the order which regulates bilingual sections, the teacher highlights that the role of the government as law-maker should not stop there; he states that some aspects of everyday-class practice could be improved such as material (to be addressed later on). He points out that the government could facilitate contact among CLIL teachers to share materials as well as experiences; thus, creating a CLIL teacher network. Furthermore, he also comments on the need for continuity in the PIALE programmes as more than a one-time experience, hence, this could be a reflection on the idea of the teaching practice as a lifelong learning experience.

13. Which qualities do you think the CLIL teacher needs to have?

He must have interest in teaching in general more than level in English, I think it is very interesting to have the idea of improving day by day. For example, I have already said I have to prepare this subject more than the rest, then I have to bear in mind that when I am at home I have to work on these materials for next day's class: you have to be willing to do this kind of thing.

Concerning the hypothetical qualities a CLIL teacher needs to have, the interviewee points out that interest in teaching (e.g. motivation) should be a top priority rather than the usual and obvious answer related to foreign language proficiency. It comes to attention the idea of continuous 'self-improvement' as he comments on the idea of "improving day by day". Furthermore, willingness to use their free time at home (like the interviewed teacher does) is other of the mentioned traits. Even though the term motivation is not used by the teacher, his answer could be understood in terms of intrinsic motivation (willingness to work at home) and extrinsic motivation (working at home to achieve better class results thanks to previous preparation).

14. Which credentials do you think the CLIL teacher needs to have?

It is a difficult question because this question could be asked for all kinds of teaching. I am answering now about this particular teaching in which you have to teach in English: you need to have a good level [of English], but this is not all because, for example, I consider myself not having a good level but I prepare my classes and I care about doing a good job in the classroom when teaching to students. This is not all, of course, but government must control this kind of thing, for example, I consider that a good level would be level C [research tries to elicit answer in regards to what type of level C]. Yes, B2 is not enough for me, I have B2

but I want to have C1 so maybe nowadays it is necessary to have a C [level].

In a similar line to the previous question, this item endeavours to uncover the teacher's opinion about credentials referring to CLIL teachers. He considers having a good level of English as one of the credentials the government should bear in mind: from his point of view, the current B2 credential is not enough and he states that having a C level (he would like to get a C1 level) should be mandatory for CLIL teachers.

15. What would you have preferred? Teaching Physics and Chemistry in English or in Spanish? Why?

It depends on the subject, there are subjects that I love, for example, Physics in 2º Bachillerato, that I am very happy teaching in Galician or Spanish but I am also very happy when teaching in English in 2º ESO. It is a difficult question, it depends more on the subject more than the language.

*Follow-up question: If you could pick the language of instruction for this 2º ESO Physics and Chemistry subject, which one would you choose? English? Galician? Spanish? And why?*

Nowadays in English, in this high-school Spanish is used with students with problems (the support group). It is more motivating teaching in English because you have better students, but this is a special situation here. In general, it depends on the students, in equal conditions maybe I'd prefer English because it's motivating for me as I've said before, I'm thinking more about the subject in this situation, it is also more work but also more motivating.

Concerning his language of preference to teach Physics and Chemistry the teacher points out the answer is not as dependant on the language but the subject: he is happy teaching Physics (2° BAC) in Galician or Spanish but also teaching Physics and Chemistry (2° ESO) in English. In order to get a more specific answer in regards to the studied groups, a follow-up question was made to garner the teacher's language preference; his language choice for the 2° ESO group is English as this language is more motivating for him (though he admits it is also more work). Moreover, he contextualises his answer with the situation of the centre: Spanish in scientific subjects is only used in the support group (low achievers), thus, students with no academic difficulties would be taught in English. This resonates with the idea of bilingual sections as segregating entities (Dalton-Puffer et al., 2010).

16. In your opinion, what are the current challenges of the CLIL teacher in Spain?

Difficult question...[prolonged silence]

*Follow-up question: Or, if you want to be more specific in Galicia?*

I go on thinking about the previous answer I gave you about sharing information among teachers working in this type of subjects and this is a role the government must take to connect all these teachers to put on the table different ways of teaching to choose and pick. I think it is the most important thing because you are very alone. To have common material in Galicia, it is very difficult to find good material from Spain in English. It is very frustrating because materials not done in Spain do not comply with the curriculum. If I could have a set of materials used by all teachers in Galicia, it could be better and easier for teachers and students.

This question seemed difficult to the interviewee so, in order to elicit an answer and bearing mind the context, a follow-up question was made which only differed from the

original by specifying Galicia. After giving him this piece of input, the teacher referred to his previous answer regarding sharing materials among CLIL teachers (Question 12) and he also comments on the loneliness of teaching so he proposes having a set of materials used by all teachers in Galicia to facilitate the teaching and learning process for both teachers and students. Furthermore, he also considers the quality of the current materials; he thinks materials done in Spain are not very good and materials not created in Spain do not comply with the Spanish curriculum, thus, the choice of materials becomes very limited.

17. Have you felt fully supported by the academic staff in your CLIL teaching? Has there been any obstacle on the CLIL implementation?

I am comfortable, you have to cooperate and work in group with other teachers, but I think about students and they deserve more than this. Not having good materials adapted to Galicia makes you waste time looking for materials.

[Researcher emphasises ‘academic staff’]

Ah, no, no, it’s okay, yes, yes, I was thinking of ‘staff’ as the government. But with the staff there’s no problem.

Support from the academic staff and other groups such as parents is a significant element which needs to be considered in the implementation and management of these sections. When asked this question, the teacher seemed to think the researcher was referring to the government and he reported the government should do more for the sake of the students as he feels they deserve more effective methods and materials than the current ones. However, when the term ‘academic staff’ was repeated he emphasised that there were no problems and he felt supported by the high-school academic staff: this perception is in direct

contrast to other studies in which CLIL teachers report not feeling fully supported by the academic staff (Pladeval-Ballester, 2015).

18. What are the advantages of the CLIL sections for teachers? And for students?

For teachers, this is very motivating because you are improving your level in English, you are continuously learning specific vocabulary, you are talking in English, you are teaching in English and this is very motivating as it is not your usual language. You have to prepare the material, you have to make the classes more visual, then it is more dynamic. For example, you have a lot of experiments in the laboratory, you have a lot of work but it is very motivating and encouraging.

For students, the classes are more dynamic than the normal classes, they are not so academic, you try to do different kinds of work and in different ways so it's not exactly like the Spanish subject. In the Spanish class you have your book, your exercises, you go to the lab when you need, but here you try to go more, you try to do things differently because it is more difficult for students, the subject is in English then you have to try alternative ways to teach.

Regarding the advantages of the CLIL sections for teacher, the interviewee had already pointed out some of these briefly in the previous questions (e.g. improving his English level) but he specifies further this answer: his first thought is the motivating nature of improving his English because of its constant use while teaching, talking and learning new specific vocabulary. Furthermore, he links the fact of preparing the lessons in English to a more visual and dynamic class practice and, although he acknowledges the increased workload because of it (e.g. preparing the experiments in the lab so to give students a more visual approach to the content), he finds this “very motivating and encouraging”.



Concerning the advantages of the CLIL sections for students, the teacher focuses on the methodology-based changes as he believes the different types of work and activities (e.g. going oftener to the lab than in the non-CLIL lessons) are productive to the students' learning process. He uses the term 'dynamic' to describe the lessons in contrast to 'academic' which could be analysed in terms of classroom dynamics (there are more changes in the rhythm of the lessons than in non-CLIL lessons), but also in regards to the content used in these classes as the teacher stated the content in CLIL to be simpler than in non-CLIL lessons due to issues concerning the foreign language (Question 10).

19. What are the disadvantages for teachers? And for students?

For teachers, maybe you have to waste your time working a lot previously, you have less spare time.

For students, maybe in general it is more difficult because of the language, they have to make an effort to pass the subject. Of course, you try to do the explanation and the contents easier, not the objectives because they have to be the same. It depends on the students, I think it is better for good students but for not-good students the difficulty of English is a handicap.

In regards to the disadvantages for CLIL teachers, the teacher only points out the already mentioned issue of time as preparing lessons take more time and he does this in his spare time. When asked about the disadvantages for students, the teacher mentions the difficulties the language of instruction (English) could bring to students' learning process, but he also mentions it depends on the type of students. Furthermore, he ponders on these language difficulties for low-achievers by concluding that English could be a handicap for them.

20. Are there enough CLIL human resources available?

Yes, we have a language assistant, but it is difficult to make use of them in Physics and Chemistry. I would love to work with the language assistant with a profile of Physics and Chemistry, but they have different profiles and backgrounds and it would be difficult to make this language assistant suitable for this particular subject.

*Follow-up question: If you had a language assistant with a profile in Physics and Chemistry, would you use it?*

Maybe, it would be very interesting.

*Follow-up question: So do you think we have enough human resources?*

We have enough, but I think the government must think about the high-school profile. Here in this centre, we have the English sections in Science, they could look for language assistants who have this kind of background, it may be difficult but they could try and this is not the situation at the moment.

[*Researcher's note: a language assistant with a scientific profile arrived in the high-school in the academic year 2017-2018. He participated in the laboratory lessons.*]

According to the *Orde 12 maio* (2011), it is possible for centres with bilingual sections or plurilingual centres to have a language assistant. In the academic year 2016-2017 the studied centre counted with a language assistant, though the CLIL teacher made no use of her. Although he would have liked to work with her, he points out that it would be difficult because she did not have a scientific profile so it would be difficult to work with her. When asked about the hypothetical case of having a language assistant with a scientific profile, the teacher shows interest. In fact, in the follow-up question, he comments that, even though he feels there are enough human resources, the government should bear in mind the type of

CLIL sections of each centre (in this case, CLIL is implemented in scientific subjects) and try to send language assistants with a suitable profile to work on the CLIL subjects.

21. And CLIL material resources? What is your opinion about them?

We have here [in this high-school] very good American materials that we got many years ago. The problem is finding good materials according to the syllabus in Spain and Galicia. Nowadays publishers are creating materials in English but, from my point of view, they are very bad and there are not enough. There are books for 2º ESO in English from MacMillan and Oxford adapted to the Spanish curriculum, but I prefer our book [the American one] and complete it with my own materials to follow the curriculum because I can notice in the other books that there are translations from Spanish.

The teacher's opinion on CLIL materials has been discussed in previous questions (Question 12, Question 16) and he repeats again his displeasure with textbooks in English adapted to the Spanish curriculum as he notices they are translations from Spanish. Therefore, he prefers using an American textbook –which he describes as “very good”– for native speakers and complete it with his own materials adapted to the Spanish and Galician curriculum. This willingness to work on materials rather than picking a simpler option such as a textbook already adapted to the Galician curriculum could be taken as further proof of the teacher's commitment to the teaching process and the CLIL methodology.

22. Have you noticed any difference in the achieved aims in the bilingual sections and the monolingual ones?

No, we cannot have differences in the objectives and my previous work is to match the materials in English with the syllabus with all the objectives, we have the same

objectives with different materials and methods.

[Researcher paraphrases to ‘levels of achievement’]

No, the differences are in the methods, only in the methods, we have the same standards, we only work the standards in a different way.

*Follow-up question: Do you think it would be necessary for the bilingual sections to have different standards?*

Good question, no, I don’t, because it could be very difficult to explain from a legal point of view.

This question proved to be complicated due to the terminology used: while the purpose of this question was to find out whether the teacher perceived differences in the achieved aims of students in bilingual and monolingual sections (e.g. whether the levels of achievement were different), the teacher answered in regards to the aims of the curriculum: he rightfully points out that the aims and the standards have to be the same for CLIL and non-CLIL groups, the only difference in the methods used. When asked about implementing different standards to the CLIL groups, he considers it but he feels it would be difficult to explain due to legal reasons.

23. Do you think bilingual or, in this case, plurilingual students are more motivated than their monolingual counterparts? In what sense?

I think so, but it depends on the type of student, good students are more motivated than the monolingual subject because they have another challenge apart from passing the subject, but maybe students think the opposite. For good students, it is a challenge but for bad students it is a handicap.

*Follow-up question: Do you see any difference in regards to motivation in these two classes [academic year 2016/2017]?*

Yes, from my point of view [group] A is more motivated in the class but the results are worse than [group] B, it's incredible but this is the reality in this case. In B, you have a group of very good students, then they can pull the rest of partners, the results are better. Also the classroom environment is more difficult in B because there are more annoying people. I prefer A but the results are worse, it's incredible.

*Same question in the academic year 2017-2018:*

This group [C] is not like the others. Fundamentally, the academic level is lower than group A, they are more undisciplined. This would be the most apathetic of the [three] groups.

The teacher is wary of giving a definite answer in terms of motivation in plurilingual/bilingual and monolingual groups so he provides an answer in regards to the type of students: he states that good students are motivated by the extra challenge of learning in English but bad students may find this to be a handicap though he wonders whether students think the contrary.

In order to gather more information on the teacher's perspective of motivation, a follow-up question was asked in which the teacher had to share his thoughts on his groups of students. It is worth pointing out that the teacher does not link academic achievement to motivation; in fact, he points out that, even though B has better results than A, he feels A are more motivated and their behaviour is better than group B. In regards to group C, he also points out their academic level is worse than A, their behaviour is worse than the other two

groups and he describes them with the term ‘apathetic’ which could be linked to the concept of ‘amotivation’ (lack of any type of motivation; Deci & Ryan, 2002).

24. What is your motivation for teaching in the CLIL sections?

As I’ve said before, it is motivating for me to speak in English and teach in English because I like English and I would like to speak English very well. I think I have an ideal perfect subject to teach in English, English is the universal language for science and teaching science in English is also a good way to communicate sciences, this is very motivating.

As mentioned in previous questions (Question 15, Question 18) the teacher finds motivating speaking and teaching in English. Furthermore, he feels that teaching a scientific subject such as Physics and Chemistry in English is motivating as English is the universal language for science; thus, paying attention to the context in the scientific realm. This perception could be linked to the teacher’s opinion of educating in context (Question 11).

25. Are the CLIL programmes promoted by the *Xunta* being effective?

I only know PIALE, I like it, it was very useful for me, I don’t know any other programmes.

The teacher mentions again his experience with PIALE as the only CLIL programme he knows. The fact that only one programme comes to his mind could answer to a lack of teaching training programmes focused on the methodological and didactic implications of CLIL (see Chapter 3.4).

26. Are these programmes enough for promoting foreign language?

As a programme it is enough because you can repeat it every two years. I think it is

enough but I would complete this programme with other programmes which stimulate cooperation among teachers.

Concerning programmes on foreign languages, the interviewee thinks PIALE is enough as it can be repeated every two years but he adds other programmes to promote cooperation among teachers should be offered.

27. What else could be done?

It is related with this cooperation and the need for materials I have said. It is a very difficult situation at the beginning of the course, to adapt materials. If all teachers had the same 'frame' to work on, it would be interesting.

Again he emphasises the need for cooperation among teachers, especially to tackle the issues on materials he has talked about in the interview. According to him, it would be interesting for all CLIL teachers to have the same framework to work.

28. Is there any formal assessment for the CLIL sections done by the *Xunta*? If not, do you think it would be necessary?

Yes, at the end of the course we have to do a 'memory' with the coordinator of the section (she's an English teacher). I think this assessment is just bureaucracy, I think it's not useful.

*Follow-up question: Do you think a more practical based assessment would be useful?*

Yes, the government has the resources to do it, for instance, by the [high-school] inspector.

As stated in the *Orde 12 maio* (2011), the teacher mentions the mandatory report the coordinator of the section and the CLIL teacher need to write at the end of the academic year

(2011, p. 10345), but he challenges the usefulness of this document and considers it “just bureaucracy”. When asked if a more practical based assessment would be useful, he answers affirmatively and he even gives out a solution to this issue by pointing out the government has resources such as high-school inspectors to carry out this assessment.

### Classroom Practice

29. Do you make any type of adaptation to the aims and contents of the curriculum to facilitate the teaching in English?

In contents, the resources I have are the book and I try to adapt it to the standards. To achieve this objective I have to complete these with my own notes, for instance, handouts.

As previously mentioned, the teacher needs to adapt the resources to his disposal (e.g. the American textbook) to comply with the Galician curriculum and the standards. In fact, one of the CLIL teacher’s functions found in the *Orde 12 maio* (2011) states the teacher’s responsibility to elaborate specific curricular materials (2011, p. 10353). He does it by means of handouts with his own notes (see Appendix F: Classroom Materials).

30. Is your teaching style different in the CLIL classrooms than when teaching in Spanish? In what sense?

My style is different. For example, I miss more freedom in the English classes. As I have said before, I need to prepare and know what to do at every moment; it has advantages and also drawbacks or disadvantages. In regards to disadvantages, I am less free, this lack of freedom is for two reasons: first of all, the material, I have to join all the material so I have to be concentrated in the classroom to know what goes



next and it is less free than when speaking in Spanish or Galician.

As he had already mentioned in Question 7, the teacher perceives a difference in his teaching style due to what he sees as ‘lack of freedom’: he needs to know what to do at every exact moment. He points out two reasons for this lack of freedom: (1) blending all the materials (e.g. textbook, handouts, experiments) results into having a clear idea of what to use next; and (2) the use of a foreign language rather than the mother tongue is constraining, probably due to the fact the flow of speech is not as natural as with Spanish and Galician.

31. Do the types of activities change compared to those of a non-CLIL lesson? If so, in which way?

Yes, in CLIL we have more specific homework for students, we have a lot of handouts and most of these are very simple questions about completing, less questions to develop. In Spanish and Galician lessons you have more questions to develop than in English. They are working more individually than in the Spanish lessons because they have to face the difficulties with language individually.

The teacher admits that activities in the CLIL group differ from non-CLIL groups primarily in regards to homework and handouts: he points out questions are of a simpler nature in the CLIL class (e.g. filling the blanks) than in the non-CLIL class (more questions in which students need to develop answers). This could be linked to low order thinking skills in CLIL classes (LOTS, e.g. understanding by filling in the blanks) and high order thinking skills in non-CLIL classes (HOTS, e.g. creating and evaluating content such as in developed answers) (Krathwohl, 2002) due to the ‘extra difficulty’ of the language of instruction. This hypothesis on the language of instruction as a defining element in the cognitive demands found in classroom activities is further proved by the teacher’s answer on why CLIL students work individually, that is, to face language-based difficulties.

32. In percentages, how much English and how much Spanish do students use in the classroom?

It depends on the type of student. In general, 10%, because you have good students who speak English 100%, but other students who speak 0%. Taking into account that you have a class of 20 or 25 students and 2 or 3 good students then yes. 10 or 15%.

[Same answer was provided in the academic year 2017-2018]

The teacher makes a point to explain the different students' profile before giving out a percentage: there are students who speak English 100% but there are others who do not use this language at all. Therefore, the groups' average in regards to use of English (the number of students in the three groups is around 20 students) would be 10 or 15%.

33. In which language do students ask questions? And in which do they answer?

The same, good students [ask] in English. It is different about answers, if they are answering about homework, they have prepared it at home and they read it in English. But if it's not a written answer, then the good students [use English]. Or if it's a one-word answer, then everybody.

[Same answer was provided in the academic year 2017-2018]

Following the answer given in the previous question, he points out good students ask in English. In regards to students' answers, he states they use English when they have prepared the answers at home but, if they have not written down the answer, only good students use English. This is certainly linked to timing as students have more time to prepare their answers for their homework (done at home and maybe with help) but in-classroom activities require a more instantaneous input to the questions; thus, students may choose to

use the mother tongue. However, the teacher also comments that all students answer in English when it is a one-word answer.

34. In percentages, how much English and how much Spanish do you use in the classroom?

In my case, 95% in English and 5% in Spanish (only when I have a difficult or very important concept that I am interested to make clear).

Also I have to tell them off more in this group so I use more Spanish for that [information added for Group C in 2017-2018].

The teacher thinks he uses English a 95% of the time and only switches back to Spanish when trying to explain a difficult or important concept (5%). In addition to this, the interviewee points out that he tells off more in Group C so he uses Spanish for that: the fact that he uses the mother tongue to tell off could be related to (1) a desire not to ‘waste time’ trying to find the right words in English and (2) to make students pay more attention with the language switch.

35. Is Spanish/Galician necessary in some cases?

Yes, in special cases, for difficult concepts or to do difficult translations, I try to use synonyms or using the meaning in English, but sometimes it is impossible or do not have enough time in the classroom and you end up translating one word.

The use of the mother tongue in the CLIL classroom has been a hot topic of discussion among researchers (Gené Gil, Juan Garau & Salazar Noguera, 2012; Méndez García & Pavón Vázquez, 2012; Li & Yi Lo, 2017) with the term ‘translanguaging’ –“the integrated conceptual/linguistic system through which plurilingual individuals process and use language, with the social reality of different languages” (Cummins, 2016, p. 9)– as the

key element to understand the advantages of using the mother tongue in the FL classroom. In regards to the use of Spanish or Galician in the CLIL lessons, the teacher alludes to the need to use these languages when dealing with difficult concepts or tricky translations, although he endeavours to deal with these difficulties by means of using synonyms or explaining the meaning. However, he admits to translating some words to save time.

36. Do you think students improve their communicative competence with Physics in English due to the formulaic language used in the subject?

Of course I think so. At least, and this is only at least, about vocabulary because they are learning new and specific vocabulary and not so specific because you're using vocabulary that they're not using in the English classroom but it is useful in general.

The teacher believes having Physics in English makes students improve their communicative competence thanks to its formulaic nature. He points out that they improve both specific and non-specific vocabulary not used in the FL classroom but useful nonetheless. He was very adamant about emphasising the 'at least' in his answer so he probably believes other areas are improved, but he did not elaborate further. This perception about CLIL as a way to improve vocabulary is further backed up by research (see Chapter 4.2).

Overall, the results gathered from the teacher's interview may lead to conclude that:

- The interviewed CLIL teacher is highly motivated in regards to his CLIL teaching practice: he has been part of the CLIL programmes implemented by the *Xunta* since its official beginnings in 2010-2011. Furthermore, he has participated in programmes such as PIALE to improve his English skills and he still endeavours to improve on his own (e.g. going to conversation lessons once a week). During his interview, he

has also pointed out the importance of wanting to improve day by day, not only English but the teaching practice as well.

- He thinks CLIL sections are overall positive as he feels the subject concepts are more fixed due to the extra challenge of using a foreign language. Moreover, he feels CLIL lessons are more dynamic and interesting to students as there is more variety in terms of activities. He also shows his appreciation for the *Plurilingual Decree* (2010) as he believes it sums up the current linguistic reality.
- However, he is aware of some shortcomings in regards to the educational law establishing bilingual sections: he mentions that the government does not take into account the role of the teacher in, for instance, creating materials and he asks for cooperation among Galician CLIL teachers in order to share experiences and materials. He also considers that human resource such as the use of language assistants in CLIL could be improved (e.g. sending language assistants with background knowledge of the content subjects) and assessment should be more practical rather than bureaucratic.

### **6.3. Systematic Classroom Observation**

The systematic classroom observation was carried out in March-April 2017 (Group A & B) and February-March 2018 (Group C) in order to observe the activities and tasks done in the same didactic unit of the Physics and Chemistry 2<sup>o</sup> ESO curriculum (Unit 6: *Solutions*). It is important to mention that the different timing from these two academic years (March-April and February-March) was caused by the different periods of bank holidays in these years and no other time-related variables were found. However, it should be mentioned that two groups (A & B) were observed in the first academic year while only one CLIL group was created in the second academic year.

As audiovisual recordings of the lessons were not possible, the classroom observation is based on in-classroom transcripts. These were analysed using some of the observational items in Guilloteaux & Dörnyei's (2009) MOLT observational scheme as well as other selected items which were found to be significant after the pilot observation. According to these, the spheres of observation are:

- Learner's Behaviour
- Teacher's Discourse
- Classroom Dynamics

These issues were coded following a *low-inference* categorisation of the data due to the fact that “even in real-time coding (e.g. ongoing coding during observation) the observer can reach almost perfect reliability in recording instances of it” (Dörnyei, 2007, p. 180) and other types of categorisation such as *high-inference* in which data analysis is also carried out while performing real-time coding would not be possible due to the classroom pace and the numerous interventions.

The number of observed lessons corresponded to a whole didactic unit as well as the usual laboratory practices. In total, ten lessons were observed for each group: the first eight lessons were carried out in the usual Physics and Chemistry classroom and were dedicated to theoretical explanations coupled with some in-classroom experiments carried out by the teacher. The last observed lessons had place in the Physics and Chemistry laboratory and were focused on putting into practice the knowledge acquired from the previous lessons by means of practical exercises in small groups. The close observation of these lessons has led to the following results.

### *Learners' Behaviour*

As posed in Chapter 4.3, affective factors do not only influence individual behaviour but they also have to do with classroom behaviour. Therefore, this subheading describes and analyses learners' behaviour bearing in mind the 'social self' (Csizer & Dörnyei, 2005) – rather than the 'individual self' (already analysed in Chapter 6.1)– as a key element in classroom behaviour.

Firstly, some considerations on the groups' profile should be given:

- Group A (18 students): this group is the only one in which the number of female students (N=12) is prominently higher than the number of male students (N=6). Even though the aims and research questions do not specify on analysing the gathered data in terms of gender, it may be an element worth mentioning in this subheading.
- Group B (22 students): this is the group with most participants (9 female and 13 male) though seldom was the group complete during the classroom observation and assistance was less homogeneous compared to Group A or C.
- Group C (21 students): this is the only CLIL 2° ESO group in the academic year 2017-2018 as the number of students in this year was lower than the previous one. In contrast to Group A, this group is formed mostly by male students (N=13) with female students being the minority (N=8); however, these numbers are not as 'extreme' as in Group A (the number female students doubled up the number of male students).

Behaviour and affective factors are fluctuating elements which may change in a short period of time; therefore, the results shown in this study in regards to students' behaviour observation should be treated with caution due to the ever changing nature of affective factors linked to behaviour. Having said that, the longitudinal nature of the study along with the

different studied groups make up for any void in the veracity and value of the following conclusions. In order to systematise the information gathered, the following categories are drawn based on Waninge's study (2014) and Guilloteaux & Dörnyei's (2009) MOLT observational scheme: engagement and interest.

1) Engagement: alertness and focus on the task are the items studied in this element of classroom observation. Some differences in regards to groups and types of activities could be appreciated during the observation.

- Group A: overall, Group A showed alertness on both classroom activities and laboratory activities. Student-teacher interaction was greater in the theory-based classrooms as students asked the teacher to write words he had said out loud (e.g. "Can you write *dissoluble*?", "Can you write it [coffee powder] in the board?"), to repeat an explanation (e.g. what to do in an exercise) or to modify some aspect not related to content (e.g. "Can you hacerlo [the digital board] más grande?"), though the last two were present to a lesser extent. These questions posed by students show alertness to what happens in the classroom. It is worth mentioning that most of these instances have to do with issues with the language of instruction. However, it must be pointed out that their focus on the activities during the theory lessons depended on the period they were in to some extent. For instance, in some lessons they started packing up before the bell rang even though they were still correcting 'Apply' exercises (the next period was recess) but they continued working on the activities for next day in the spare time they had before the lesson finished (the Physics and Chemistry lesson was right after recess). This may lead to state that students' engagement is linked to the timing of the lessons.



- Group B: this group is usually unruly and the teacher had to tell them off a couple of times. It should be also mentioned that there are two students who do not participate in any way in the theory-based lessons (they sit at the back with headphones on; the teacher allows this to avoid daily disturbances in the classroom) though they work sometimes during laboratory activities. Despite this, some interventions showed students' alertness at some moments, most of these related to language issues (e.g. "¿En la cuarta palabra?", "¿Qué pone ahí?") though some of them were related to content while correcting homework (e.g. "¿Cual es la 7?", "And the third one?"). Students are the most alert when copying instructions from the blackboard or comparing their answers with those from the whiteboard. In regards to their behaviour and alertness, one of the observed lessons stood out due to the fact that most students were with their arms crossed on the table and not paying much attention though this is likely linked to the fact they had arrived from a school trip, the blinds are half-closed due to the sun (the only source of light being the whiteboard) and the class was during fifth period.
- Group C: out of the three groups, this group proved to be the most unruly in terms of classroom behaviour as the usual warnings from the teacher could attest. However, it is true their Physics and Chemistry timetable could have something to do with this as they either have this subject in first or second period or Monday afternoon last period. However, despite these issues, students showed some 'alertness' in regards to the lessons when asking questions such as "What is the page?" or "Profe, ¿hay que copiar eso? [Teacher, do we need to copy that?]"

2) Interest: interest goes a step further than engagement. According to Waninge (2014), this attractor stage is based on the concepts of ‘engagement’ and ‘enjoyment’. In order to analyse this, the following results focus on students’ participation and volunteering (Guilloteaux & Dörnyei, 2009) in the observed lessons.

- Group A: concerning participation, this group is highly participative in terms of answering the teacher’s question. Among these interventions, one-worded answers in English (e.g. “a mixture”, “heterogeneous”) as well as in Spanish when the teacher asks for the translation (e.g. “cobre [copper]”, “latón [brass]”, “quedar restante [remain]”) are the most common types of participation with most of the group answering, sometimes everyone at once. This could be highly significant as most of these one-worded answers are content-based language. It should be pointed out that the CLIL teacher seldom asked a question to a particular student so answering questions is usually voluntarily. Furthermore, other interventions worth mentioning were gathered such as answers to activities from the textbook (e.g. “It breaks into pieces”) and adding information to the teacher’s answer (e.g. “Because it is a mixture and cannot be seen by the naked eye”). Apart from these, students also ask questions which show their interest in the subject and the language of instruction:

Student: “How do you say *flotar*?”

Teacher: “Float”

Student: “Ah, so wood floats in water”

(Excerpt 1)

Student: “¿Puede ser *chocolate powder* en vez de *chocolate*? [Could we say *chocolate powder* instead of *chocolate*?]”

(Excerpt 2)

Student: “¿Por qué el agua se evapora y deja cristales? [Why does wáter evaporate and leave crystals?]”

Teacher: “Ok, crystals are the solids; we’re talking about solutions. ¿Entendéis esto? Con sustancias puras no queda nada detrás [Do you understand this? Nothing remains with pure substances]”

Student: “Es que vi un experimento donde recogían agua de lluvia, se evaporaba y quedaban cosas [I saw an experiment where rain was collected, it evaporated and things remained]”

(Excerpt 3)

Student: “¿Y que el condensador dé tantas vueltas tiene algo que ver? [Does it have anything to do with all the condenser’s spinning?]”

(Excerpt 4)

As seen, both English and Spanish are used when students speak of issues which may interest them somehow. It should be also accounted the unprepared or sudden nature of these interventions (they were not mulled over as, for instance, when answering homework). Furthermore, this code-switching from Spanish to English and forth was also present during the only task where students had to work collaboratively: the laboratory experiments. During these student-student interactions, English was mostly used for content-based terminology:

Student 1: “Le tenemos que meter water [we have to put water]”

Student 2: “No tenemos la mix [We don’t have the mix]

(Excerpt 5)

Student 3: “¿Hay que dibujar los steps? [Do we need to draw the steps?]”

Student 4: “Steps?”

Student 3: “Pasos [Steps]”

(Except 6)

In addition, this group professed their interest in the teacher’s practical demonstration of separating oil and water during one of the lab lessons: murmurs of interest were heard along with sentences such as “Oh yeah” and “¡Qué guay! [That’s cool!]”.

- Group B: unlike Group A, this group is not generally that participative and mostly the same students were the ones to answer the teacher’s questions. Nevertheless, questions regarding translation of words such as ‘mud’, ‘become’ and ‘degrees’ among others were answered by students who did not usually participate in the classroom and even some competitiveness to see who answered first could be appreciated. Even though students do not ask and do not seem as engaged with the content such as the previous group, some questions were asked during the observed period:

Student: “Mud is like solid water, right?”

(Excerpt 7)

Student: “Teacher, when is the exam?”

(Excerpt 8)

Student: “How many of these exercises do we have in the exam?”

(Excerpt 9)

It is significant to see that students asked these questions in the language of instruction rather than the L1 or code-switching (as Group A). Students feel comfortable speaking in English, though it should be pointed out these questions were

not specifically related to content. Moreover, it cannot go unnoticed that students ask repeatedly about the exam: this interest in the objective testing of the content could fall into the academic goals reported in the achievement goal theory (Covington, 2000).

Despite the fact that this group of students seemed to have a low level of interest in the subject, there were some occasions in which they seemed to find the lesson interesting:

Teacher: “New expression to know, a phrasal verb, *to break free*”

Student 1: “Es una canción [It’s a song]”

Teacher: “Of what band?”

Student 2 (one of the less participative students): “*Queen*”

Teacher: “That’s *liberar* [to break free]”

Students: Ah [interested]

(Excerpt 10)

Teacher: “Shutoff in Spanish is like *llave de paso*”

Students: Ah [interested]

(Excerpt 11)

These examples are not necessarily related to interest on the content but they are proof students are interested when the content is related to their likes (e.g. *Queen*) and their context (e.g. comparing items in English to their Spanish counterpart).

- Group C: the group observed in the academic year 2017-2018 presented to be a curious mixture as their behaviour in the classroom was quite unruly (e.g. some students got up from their tables and went to check other groups during the lab practice) but they were quite participative and volunteered quite often to answer

questions and correct exercises. Like the aforementioned groups, high levels of participation were observed when the teacher asked students to translate words into Spanish (e.g. “alloy [aleación]”, “acero [steel]”, “formigón [concrete]”).

Furthermore, students posed questions related to the language and the content as well:

Student: “What is mud? Cómo lo identificas? [How do you identify it?]”

(Excerpt 12)

Student: “Profe, ¿*carbon dioxide* es lo mismo que dióxido de carbono, no? [Teacher, *carbon dioxide* is the same as carbon dioxide, right?]”

(Excerpt 13)

Student: “¿La primera [pregunta] no puede ser mixta? [Can’t the first question be a mixed one?]”

(Excerpt 14)

Student: “[Teacher’s name], mañana vamos a ir al laboratorio? [are we going to the lab tomorrow?]”

(Excerpt 15)

Student: “Profe, ¿podemos hacer una práctica? [Teacher, can we do a practical class?]”

(Excerpt 16)

It cannot go unnoticed that code-switching and also Spanish appears on students’ interventions when it comes to questions (similar to Group A). Furthermore, students showed interest in the laboratory lessons by asking the teacher to go in multiple occasions (e.g. Excerpt 15 & 16) and show disappointment when the teacher denies their request for the time being. This desire to go to the laboratory could be related to the fact that (1) students have more freedom to complete the laboratory tasks than the usual classroom activities, (2) going to the laboratory is an unusual classroom

practice, and (3) students prefer more visual and kinaesthetic activities. This last option could be supported by some observed moments in the lessons; for instance, students were the most quiet and focused (without the usual chatting) when they observe the teacher do an experiment in the lab (he took them in groups to watch perform the experiment) and when they had to record a diagram from the whiteboard in their notebook. In fact, this last item was an interesting element for some students as they asked whether they would be allowed to use it in the exam:

Student: “Y si preguntas esto, ¿podemos hacer el dibujo [en el examen]? [If you ask this [in the exam], can we draw the picture?]”

Teacher: “If I ask, yes, maybe”

(Excerpt 17)

#### *Teacher's Discourse*

The CLIL teacher has been one of the constant elements during this longitudinal study as the orchestrator of the learning process in the three groups. He has shown to be highly committed to his teaching practice: his careful preparation of the lessons, his creation of materials adapted to the curriculum and his desire to improve his level of English could be appreciated in the direct observation of the classroom. All these elements were present both in the teacher's interview and in the classroom observation.

It should be also pointed out that the TTT was higher than STT in the theory-based lessons (e.g. teacher's explanations) though STT was higher in laboratory lessons as students talked to each other and the teacher was only supervising. In regards to the purpose of this research, it is important to analyse the teacher's discourse in terms of promoting students' engagement and interest. In order to do so, the teacher's discourse analysis focuses on three

categories taken from Lofft Basse's study (2016): 1) Arousing curiosity or attention and 2) establishing relevance. Furthermore, 3) positive input and feedback is to be studied.

- Arousing curiosity or attention: it is necessary to look into the teacher's speech to consider whether any part of his discourse promotes curiosity or attention in students. One of the most repeated items in the teacher's repertoire in terms of promoting attention and encouraging students is "come on":

Teacher: "Come on, you know it [the translation of a content-based term]"

(Excerpt 18)

Teacher: "An example, come on"

(Excerpt 19)

Teacher: "Come on, next question in your book, you have the answer in the last sentence"

(Excerpt 20)

Teacher: "Come on, [write down] the steps"

(Excerpt 21)

It should be pointed out that the teacher used this expression with Group B (Excerpt 18 & 19) and Group C (Excerpt 20 & 21) while this form of encouragement was not used in Group A. This could be related to the fact that Group A was the most lesson-focused group (both the teacher's interview and the direct observation of the classroom agree on this) so the teacher may not have felt it necessary to use this input. Furthermore, the use of 'come on' is different when used in Group B and Group C: in Group B it is used to promote engagement in the lesson by encouraging students to give out the translation of an item and, what is more, the teacher uses positive wording in Excerpt 18 by stating his faith on students' knowledge ("you know it").



Also this expression is used to encourage examples of a theory-based principle (Excerpt 19). These examples are proof of the teacher's efforts to promote engagement in the group which shows a higher level of apathy towards the lessons. In regards to Group C, the aim of using 'come on' is to steer students towards the tasks they need to complete (e.g. completing the lab report); this resonates with the group's profile as they are likely not to pay attention for a long period of time.

Moreover, other pieces of the teacher's discourse also cater for attention in a more explicit way:

Teacher: "Pay attention to this last paragraph"

(Excerpt 22)

Teacher: "Pay attention, I'm not involved with the experiment, you're on your own"

(Excerpt 23)

Teacher: "Now, pay attention [performing a new experiment]"

(Excerpt 24)

Teacher: "Pay attention to the spelling in 'dissolve', two 's'"

(Excerpt 25)

Teacher: "Remember your calculator in the exam"

(Excerpt 26)

Teacher: "Remember this word: 'distilling flask', that is 'matraz'"

(Excerpt 27)

- Establishing relevance: it occurs when "the teacher makes connections between what is being learned and students' everyday lives" (Lofft Basse, 2016, p. 182). Taking a step further, the connections between the new information and students' previous

knowledge should be also considered. There are some cases in which this link is established by the teacher:

Teacher: “We saw this before, what is it?”

(Excerpt 28)

Teacher: “Do you remember it from last year? Meteorización química [chemical weathering]”

(Excerpt 29)

Teacher [at the lab]: “We saw this in class, you remember the experiment?”

(Excerpt 30)

These interventions try to elicit students’ previous knowledge on the subject by contextualising it using their own experiences in the classroom (e.g. mentioning last year, the previous lesson, etc.). Furthermore, some examples from students’ daily lives were also used to exemplify the content of the subject such as writing common everyday drinks (e.g. tap water, instant coffee, Coke, tea) on the blackboard to categorise in terms of ‘solution’ and ‘solvent’ (this activity was particularly well met by Group B) or using students’ likes into the contents of the lesson (e.g. Excerpt 10). It was observed that these links between the content and their own reality were interesting and engaging to students as the majority were involved in the correction of these exercises and answering the questions posed by the teacher:

Teacher: “When you have breakfast, chocolate and milk, what is easier? To dissolve it in cold or hot milk?”

Students: “Hot milk! [quickly]”

(Excerpt 31)

This could be further proof of the strong impact of contextualisation in students’ motivation and interest on the content. In a similar line, all the teacher’s references to

key elements and his translation of these into Spanish and Galician (the official languages in Galicia) had turned out to be a source of interest (and even competitiveness) to students; thus, establishing a connection between the content and students' linguistic reality.

- Positive input and feedback: although positive input and feedback have been widely studied in the EFL lessons (Correa Pérez, Martínez Fuentealba, Molina de la Barra, Silvas Roja & Torres Cisternas, 2013; Diaz-Ducca, 2014; Jiang & Yi, 2014; Muhsin, 2016), no specific research on positive input and feedback has been carried out in regards to CLIL lessons. Despite that, it is necessary to pay attention to the CLIL teacher's discourse in terms of positive input and language.

First of all, the CLIL teacher used explicit positive reinforcement as an overall technique both when dealing with students' content-based answers and language-focused answers (e.g. "Good", "Very good"). He also encouraged questions and expressed his appreciation for these (e.g. "That is a very good question"); these happened more often than not in Group A and C as they were the most likely to ask content-based questions.

Furthermore, it is important to bear in mind the implicit positive discourse used by the CLIL teacher. In regards to students' correct answers, he emphasised the answer by saying it again and he even made emphasis on a particular interesting element on student's answer (e.g. "Yes, depend on"; highlighting the phrasal verb with different tone of voice). In cases when students give a wrong answer, he either used a direct approach (he said 'no' and gave the answer) or he tried to soften his negative by wording his speech in a more tactful way (e.g. "That's not exactly right").

Apart from this, the CLIL teacher's use of pronouns should be analysed in terms of positive integration and empathy to the group. For instance, it was quite common that

the teacher used the pronoun 'we' when trying to elicit answers, encouraging students to work and highlighting the fact that they were moving on in the lesson:

Teacher: "We saw this before, what is it?"

(Excerpt 32)

Teacher: "We're going to complete the definition later"

(Excerpt 33)

Teacher: "We're defining better, now we're reading"

(Excerpt 34)

However, there were some instances of the teacher's speech in which the pronoun 'you' was used with a positive input when the teacher stated students' ability to do something:

Teacher: "You can write a good definition [emphasis on 'can']"

(Excerpt 35)

Teacher: "You're applying these methods next Sunday [emphasis on 'you're applying']"

(Excerpt 36)

Furthermore, the aim of his speech in some situations is to engage students and make them become the centre of attention of their own learning process:

Teacher: "I have a question for you, can this process go on limitless?"

(Excerpt 37)

Teacher: "I can give you a clue: 'become', what is it?"

(Excerpt 38)

By addressing students in such a direct way and making them become the main entity to answer these questions (e.g. 'you'), students were more engaged than in other types of questions in which they were not explicitly addressed; this was further proved

when the majority of students were quick to answer these questions in contrast to other type of questions posed by the CLIL teacher.

Finally, even though it may not be wholly considered within the category of ‘positive input and feedback’, the teacher’s acknowledgement of the difficulty and challenges in the lessons should be considered as they are proof of his empathy towards students and the difficulties they may encounter:

Teacher: “I know these are difficult [‘Explain’ questions], but 10-15% of this exam is this”

(Excerpt 39)

Not only did he admit the difficulty of these exercise to students, but he also reasoned why these concepts were important; in this case, he appealed to students’ extrinsic motivation (to pass the exam) to make them aware of the importance of these items in the Physics and Chemistry curriculum.

### *Classroom Dynamics*

The analysis of classroom dynamics may differ depending on the type of study, group of participants and the spheres of observation within the study. Even though there are many observable items related to classroom dynamics when conducting classroom observation, there are some factors which may influence the researcher’s observation. In this case, the classroom dynamics observed in this study need to be contextualised within the groups’ dynamics, the type of activities and even the type of subject.

First, the nature of the content subject should be accounted in terms of lesson planning. Bearing in mind that Physics and Chemistry is a scientific subject, it is not farfetched to think that most of the tasks would focus on numerical or one-word answers rather than open-ended questions (see Appendix F: Classroom Materials); therefore, students would not need to write long and worded answers. This resonates with Dalton-Puffer (2008)

and Nieto Moreno's (2016) studies in which they pointed out that writing is not one of the improving skills in CLIL students. Scientific subjects with a high demand of numerical problem-solving may not encourage writing tasks as shown in the three observed groups.

The scientific nature of the subject is linked to the type of activities students are presented: fill-in-the-blanks exercises (e.g. 'Check' exercises), classifying exercises (e.g. 'Apply' exercises) and true-or-false exercises (e.g. 'Check' exercises). These activities cater to short closed answers with very little impact on students' communicative competence. However, some other activities such as 'Predict' and 'Infer' are open-ended questions in which students need to write down a more elaborated but also succinct answer to hypothetical cases based on the theory of the lesson. Moreover, the lab activity report done at the end of the didactic unit presents students with open-ended questions in which they have to write down information such as background (e.g. theoretical principles in the experiment), description of the used materials, the procedure (e.g. the followed steps in the experiment), observations (e.g. densities in substances) and conclusions (numerical results of the experiment).

In regards to the types of activities and classroom dynamics, it is important to highlight the impact of these in students' interactions and learning process. To start with, it should be pointed out that most of the proposed activities during this didactic unit (textbook and handouts activities) were carried out individually by students, so interaction among students was limited. However, students seemed to enjoy these activities (especially, 'Check' and 'Apply') and they were quick to answer and correct them –some students (usually from Group A or C) even asked the teacher to allow them to correct these, hence, showing interest in these specific exercises–; this could be related to the repetitive and constant nature of these questions which are present in all didactic units, thus, students know what to do when they are presented with these.

However, this does not mean students work solely on their own when completing this type of exercises. Some conversations on how to complete the exercises were carried out during the observation:

Student 1: “¿Qué es el ‘tin’? [What is ‘tin’?]”

Student 2: “Estaño [tin]”

Student 3: “Lo dijo Sergio, lo dimos en Tecnología [Sergio said it, we learned it in Technology]”

(Excerpt 40)

Student 4: “Is [the statement] false?”

Student 5: “Que no sé”

Student 4: “Pues es true”

(Excerpt 41)

Even though these activities were not presented to be done in pairs or groups, some students worked collaboratively and helped their classmates to complete the exercises. Hence, this could be a reflection on the idea of students and the social self (Gu, 2009) as well as the prosocial goals (Covington, 2000) in the CLIL classroom: helping out their classmates could be related to a need of approval or a sense of belonging to that specific group (e.g. the group needs to succeed). This is further developed during the laboratory experiments: students need to work collaboratively and cooperatively in groups of 3-4 in order to perform the experiment and complete the lab report. For instance, students talked to each other on how to write down the steps or how to separate sand from water. Furthermore, some encouraged their group members to complete the report (though no encouragement was needed in the actual experiment) and they discussed what to write down:

Student 7: “Hay que echar la sal con la arena [You have to throw in the salt with the sand]”

Student 8: “¿Cómo se dice esta parte del imán? [How do you call this side of the magnet?]”

Student 7: “Que yo no sé inglés [I don't know English]”

Student 8: “Yo tampoco, pero estoy escribiendo [Neither do I, but I'm writing]”

(Excerpt 42)

Despite the difficulties with the language or the experiment, students persevere on their task and tried to overcome their slight frustration when the experiment did not go as expected (e.g. “¡Es que se queda pegado! [It's stuck!]”). As it was previously mentioned (Chapter 4.2), research has pointed out that CLIL students present a higher level of tolerance towards frustration (Dalton-Puffer, 2008, p. 4) which may be related to the inhibitory control (executive function) found in bilinguals.

Even though students work in groups, there were some instances in which students asked for help from other groups during the elaboration of the experiment. In fact, this was normal behaviour from Group C: several students stood out after completing the experiment and went to see what other groups were doing. This could be read as proof they tried to help their colleagues, thus, showing great effort in collaborative work, but it can be also understood as proof that, once their experiment was carried out, they lost interest and did not feel like writing the report. This latter option is the most plausible one due to the group's usual unruly behaviour (e.g. talking to each other while the teacher speaks) as this was not common occurrence in Group A or B.

To conclude, the systematic classroom observation allowed for an understanding of the different learners' behaviour, teacher's discourse and classroom dynamics in the three



different groups. Even though no significant differences were found among them, there are some aspects that need to be highlighted:

- Concerning interest and engagement, Group A seemed to be more motivated on an intrinsic level compared to the other groups, though the excerpts taken from Group B show them to be more extrinsically motivated (e.g. marks).
- The CLIL teacher used more expressions to encourage cooperation and ask for attention in Groups B and C. This makes sense if we consider the profiles of both groups; the former are apathetic towards the lessons and the latter have troubles focusing.
- Even though most of the materials used in the classroom promoted individual work, students worked and helped each other to complete the tasks. In regards to lab activities, Group C seemed to be the most engaged in helping out their classmates, though the reasons behind this behaviour are not totally clear.



## **CHAPTER 7: RESEARCH QUESTIONS AND PROPOSED GUIDELINES**

This chapter seeks to answer the proposed research questions of the study (Chapter 1.4) taking into account all the research tools and data gathered in the previous chapters. As the research questions answer to the three aims of the study, these should be considered bearing in mind that the research questions concretise these research aims into specific items. Therefore, while the aims of the study serve to present an overall view of the work carried out in this doctoral dissertation, the research questions provide specific information on the topics presented in the aims following a more practical rather than theoretical approach. In this line, the majority of the proposed research questions (with the exception of RQ1) deal with the observed classroom reality (three CLIL sections) so to provide the CLIL-based research corpora with a much needed in-classroom study.

Furthermore, the third aim of this study (to give a set of guidelines to improve motivation in CLIL) is addressed in the last subheading of this chapter (7.2). In order to provide these proposed guidelines, the analysis and discussion of the previous subheadings are of utmost importance as a contextual approach is necessary to draw effective measures to improve motivation to these specific groups. As it has been already stated, the proposed guidelines could be extrapolated to some extent to different CLIL sections bearing in mind the contextual differences among these. Issues such as classroom dynamics, language, individual and social profiles are taken into consideration so to provide these measures and improve motivation in CLIL.

### **7.1. Research Questions**

The proposed research questions are to be answered taking into account the theoretical framework (Chapter 2, 3 & 4) as well as the data analysis of Chapter 6. However, due their specific nature, each research question may be answered using different elements of the study

(e.g. students' questionnaire answers, teacher's interview, systematic classroom observation, theoretical framework).

<b>RQ1: Do the linguistic policies in Galicia cater to CLIL?</b>
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Information used to answer RQ1: theoretical framework (Chapter 2 & 3).
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According to the *Orde do 12 de maio de 2011* (2011), bilingual sections were promoted for both linguistic and social reasons (2011, p. 10348). This reasoning is in line with the current European desire to promote foreign language learning as a key element in the construction of a plurilingual Europe (Eurydice, 2006). Despite the traditional uptake of FL learning with sole linguistic purposes, the last decades have seen to a change of the traditional FL learning towards a deeper understanding of the different elements to be studied in a foreign language. Therefore, following the *CEFR* (2001), the Spanish as well as the Galician curriculum on FL (LOMCE, 2013) is divided into five different blocks: the four language skills (oral comprehension, oral production, written comprehension and written production) and a fifth element related to language knowledge and intercultural awareness.

As it has been previously mentioned, communication (and the communicative competence) has become a key factor in language learning. This has resulted in new methodological approaches to FL which encourage communication in these languages such as in CLIL. Due to recent educational laws and projects (*Plurilingual Decree 79/2010, Edulingüe 2020*), the number of CLIL sections in Galicia has risen in the last couple of years (Villar, 2017) so to answer to the demand of a plurilingual education boosted from European institutions. However, despite the ever increasing number of CLIL sections, it is important to pay attention whether the CLIL theoretical principles are considered in Galicia:

1. Content: the CLIL methodology is to be implemented only in non-linguistic subjects (*Orde 12 de maio, 2011*, p. 10349). Content-wise, this is the only requisite the

Galician government issues. In regards to the CLIL sections, any non-linguistic subject could follow the CLIL methodology. Research on CLIL in Galicia has been carried out on different subjects –e.g. Mathematics (Bobadilla Pérez & Galán Rodríguez, 2015), Social Sciences (San Isidro, 2017)–, but a whole array of subjects could follow this methodology.

Taking a step further, content is also linked to the learner’s own creation of knowledge and understanding; therefore, individual learning (understood as the learner’s idiosyncratic learning process) needs to be considered. In regards to this, the Spanish and Galician educational laws provide some leeway and consider students’ different levels of achievement in catering for diversity.

2. Communication: language is often referred as a tool for communication. Bearing in mind that one of the main principles of FL learning relies on the communicative competence, it is crucial that students develop their communicative skills. The communicative linguistic competence is presented as one of the key competences within the Galician curriculum in secondary education (*Decree 86/2015*). Therefore, this emphasis on communication is at least present in the educational laws which establish the didactic-based guidelines in mandatory education.

Social factors such as the internationalisation promoted by the European Commission as well as its “interest in the teaching of non linguistic subjects in a FL” have resulted in a “new change of mentality over the most effective ways of language acquisition [...and] they generated a need for even higher levels of FL proficiency compared to the past [my translation]” (*Orde 12 maio*, 2011, p. 10348): these new mentalities have resulted in the implementation of new methodologies such as CLIL which promotes both language and content as interchangeable pillars, catering to the fact that the language learned must be related to the learning context (Coyle et al. 2010, p. 42).

Taking into account this positive attitude towards communication in mandatory education, the CLIL methodology emphasises communication and agrees with the principle of ‘meaning over form’, that is, linguistic production is preferred over linguistic correctness. Furthermore, human resources such as native language assistants are considered within the order regulating CLIL sections (2011) so to help the CLIL teacher in their work and to provide students with first-hand experience with the foreign language.

3. Cognition: as it has been previously mentioned, cognition in CLIL is strongly related to students’ thinking processes and their linguistic demands. The Galician sociolinguistic context has been already described (Chapter 3.1) and this is further elaborated in the educational realm in the *Plurilingual Decree 79/2010* (2010) which states the need to implement Spanish, Galician and one FL as the languages of instruction in mandatory education.

Nevertheless, it is not farfetched to think different thinking processes would come into action depending on whether the language of instruction used is the MT or the FL. Although cognitive processes are innate to each individual, the educational laws should bear in mind these in order to create a CLIL-based framework. In this regard, only two elements established in the CLIL sections’ order could answer to this principle: (1) the FL in the CLIL section needs to be present at least a 50% (2011, p. 10349); and (2) the CLIL teacher is to be in charge of producing specific didactic materials. The former element (FL use in CLIL) caters to students’ linguistic environment: as English is not the L1 or L2, students’ contact with this language will be probably limited to classroom situations (FL and CLIL lessons); therefore, the contact with the target language and the thinking processes in this language will be limited. In regards to the second element, the extra cognitive demands the use of a FL

represents in the CLIL classroom needs to be considered; hence, materials should be adapted to students' learning context, that is, the content subject as well as the linguistic and cognitive demands concerning this methodology.

4. Culture: cultural awareness is one of the key competences in the educational curriculum (*Decree 86/2015*) which needs to be worked on in all subjects. Bearing in mind that intercultural awareness is a key objective to CLIL (Coyle et al., 2010, p. 42), the contact with the FL in the CLIL classroom needs to go beyond a mere linguistic approach, that is, cultural aspects of the target language as well as the 'source' culture are to be dealt with in CLIL. However, the role of culture in CLIL should not be constrained to the target culture, but "[i]t is intercultural competence that teachers should foster in learners" (San Isidro, 2017, p. 94), that is, the learner should be able to build up links between different cultures (e.g. 'original' and target culture).

Concerning CLIL in the Galician curriculum, the term 'culture' in regards to CLIL is not mentioned in the *Orde do 12 de maio* (2011). However, this does not mean culture is not present in the CLIL sections, for instance, San Isidro (2017) elaborates on the presence of culture in CLIL in his longitudinal study of CLIL Social Sciences groups. Therefore, the CLIL reality needs to be considered in theoretical terms (e.g. language policies) as well as in classroom context (e.g. CAR studies).

Overall, the educational laws promote the implementation of CLIL in Galicia under the *Eduliñgüe 2020* project and the *Plurilingual Decree 79/2010* which endeavour to promote and enhance plurilingualism in all educational spheres. In addition, even though they are not specific to CLIL, the communicative linguistic competence and cultural awareness have become key competences in mandatory education; thus, setting a prosperous background to work on the aforementioned CLIL principles. Nevertheless, it must be pointed out that while

the theoretical framework point out towards a theoretically correct implementation of the CLIL sections, only CLIL classroom observation in Galicia would tell with no doubt whether the CLIL principles are being applied.

<b>RQ2: Are the plurilinguistic policies applied in the studied CLIL sections?</b>
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Information used to answer RQ2: theoretical framework (Chapter 2 & 3) and data analysis (Chapter 6).
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The last Galician educational laws states that students' first contact with the FL in mandatory education is in the second cycle of Early Stages (*Decreto 330/2009*). Therefore, the average age of students' contact with the FL should be between 3 and 5 years old; this complies with the information in students questionnaires in which 43,4% (44,2% as valid percent) of students reported to have started learning English as 3-year olds (this one being the variable with the highest percentage by far). However, it is also possible that students would perceive to have their first contact with English at an earlier or later time (see Table 7: First Contact with English) probably due to the fact that they perceive their first contact with English when they started attending private lessons.

According to their educational level, students should have an A2 level (*CEFR*, 2001) in 2º ESO. However, due to learners' different paces of learning this may not be true. Notwithstanding the participants' academic results, this study endeavours to analyse students' perceptions of their own learning rather than quantitative information of their FL and CLIL results; therefore, their own perceptions on their FL language proficiency have been considered in the data analysis. According to the questionnaire's results, the majority of students believe they have an average level in the four linguistic skills with only a slight increase in the 'high level' variable related to their reading comprehension level (see Table 25: Perceived Level of Reading Comprehension in English).



Concerning the use of the FL, the *Orde do 12 de maio* (2011) establishes a minimum of a 50% FL use in the CLIL section. According to the gathered data, some discrepancies are found in the teacher's and students' perception of their language use:

- Students' questionnaire: 30-50% is the average percentage students report to speak in English in the Physics and Chemistry classroom (see Figure 35: Perceived Percentage of English Used by Students).
- Teacher's interview: the CLIL teacher states that students speak 10-15% of their talking time in English. However, he also mentions these numbers are the product of a heterogeneous linguistic panorama in the classroom (e.g. some students speak English all the time while some others do not use the FL at all).
- Systematic classroom observation: students' use of English varied during the classroom observation in regards to the type of language needed (e.g. one-word answer, questions to the CLIL teacher). Overall, STT was significantly smaller in proportions to TTT. During STT, code-switching was used specially in Group A and C. Furthermore, although Group B was the least participative group in the classroom in terms of volunteering or answering questions, they were the group in which FL use was the most constant. However, it should be also considered that some students in the three groups only spoke when the teacher asked them to read something (in English).

Concerning the CLIL teacher's English usage, his use of the L1 (Spanish/Galician) answers to two purposes: (1) to emphasise and explain a difficult concept (after having it explained in English first) and (2) to reprimand students. Therefore, it is not surprising that the CLIL teacher's use of English be high in comparison to his use of Spanish or Galician: students stated that the Physics teacher uses 85-90% of the times English as the language of

instruction while the teacher rated this to be 95%. These percentages comply with the legal requirement established in the *Orde do 12 de maio* (2011) on the incorporation of the foreign language in the CLIL classroom.

Furthermore, despite the fact that the implementation of the CLIL sections in Galicia has done much for the desired plurilingualism, other measures to encourage plurilingualism and pluriliteracies based on a more traditional approach are present in the Galician educational realm such as boosting FL learning. In this line, the White Paper (1995) and the Commission Staff Working Document Language Competences for Employability, Mobility and Growth (2012) promote the learning of at least a second foreign language in mandatory school. Taking a look at the gathered data on this issue (see Table 10: Other Foreign Languages), it is clear that a second foreign language is studied by the majority of the participants (94,3%). Therefore, it could be concluded that, theoretically speaking, the measure to seek plurilingualism and pluriliteracies by means of promoting several FL learning has been implemented in this high-school for 2° ESO students.

<b>RQ3: What perceptions towards the CLIL section do the students and the teacher have?</b>
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Information used to answer RQ3: theoretical framework (Chapter 4) and data analysis (Chapter 6).
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As it has been previously mentioned in Chapter 4, students' perceptions on CLIL could be influenced not only by their attitude towards English (the language of instruction) but also the two official languages of the autonomous community: Spanish and Galician. Bearing in mind the last report on Galician youngsters and their attitude towards Galician (*Consello da Cultura Galega*, 2017), it seems Galician is losing number of speakers among the younger generations despite the efforts from the Galician administrations to avoid this situation. This bleak panorama on the situation of Galician is found in the three studied CLIL

groups as only 7,5% of students speak Galician at home and 11,3% of them speak both Galician and Spanish (see Table 6: Languages Spoken at Home). Having stated the cognitive and linguistic advantages in bilingual speakers (see Chapter 4.2), this could certainly be a detractor to students' perceptions on their CLIL learning process.

In regards to external forces which may influence students' perceptions, it is important to bear in mind that the public's popular opinion on CLIL. Overall, many Spanish newspaper articles have focused on the disadvantages and the supposed inefficiency of the CLIL methodology (de la Nuez, 2015; Marías, 2015; Setién, 2016). These critics often answer to Burns' 'all-or-nothing' cognitive distortion (1980): CLIL is seen as an overall failure without any account of the positive elements it may bring to students' learning process, that is, the public's opinion is based on the idea that the CLIL methodology should improve all FL skills, if it fails to do so, it is considered to be a failure. Although this specific cognitive distortion has not been found in the data gathered from the students' questionnaires, some other cognitive distortions (Burns, 1980) are present when students presented their perceived CLIL disadvantages (see Table 46: Disadvantages of the CLIL Section):

- **Disqualifying the positive:** as it has been previously mentioned, some students complained that the fact of using English as the language of instruction resulted in less challenging content. It is significant that while the use of English in the content subject is seen as an advantage (e.g. learning specific words), some students do not feel these are enough positive reasons to counteract the fact that the content subject has been adapted to cater to possible language-based difficulties.
- **Emotional reasoning:** students may project their own feelings in their perceptions of CLIL. Concerning this theory, some students reported to find disadvantages in CLIL due to the fact that they have problems with English (S5A) and they think the class is boring (S11A).

Furthermore, it is interesting how the social perspective come into play in students' answers. For instance, some students wrote that the subject may be more difficult for those students who do not have a good grasp of the English language, though they did not report to have that problem themselves; therefore, their social self (e.g. students as part of a society; Csizer & Dörnyei, 2005) come into play so to empathise with their classmates and the challenges they (other students) may face. Still, it should be considered that a high number of students believe that the language of instruction makes Physics and Chemistry more difficult (see Table 21: English Makes Physics and Chemistry More Difficult). However, the gathered data (see 'Disadvantages of the CLIL Section', Appendix E: Chapter 6) shows that this is not seen as an overall disadvantage which may lead to conclude that, while students think that the difficulty of the lesson increases thanks to English, not many believe their English skills (or lack thereof) to be a problem in regards to CLIL.

In addition to this uptake on students' social selves, the social sphere is to be considered in regards to students perceptions on the FL: knowledge of English so to find a good job (see Table 41: Knowledge of English so to Find a Good Job) and the necessity to know English in our current world (see Table 42: Need to Know English in Our Current World) are two issue students perceive to be of great importance (77,4% of students strongly agreed on these two items). Therefore, it may be concluded that students give much importance to English as an element worth having for their future careers and as the undeniable *lingua franca*.

However, the numbers are not so categorical when students had to decide whether they believed learning Physics and Chemistry in English would be advantageous in the future (see Table 43: Learning Physics and Chemistry in English Will Give Students Advantages in Their Future as Students/Workers) or whether their spoken English had improved thanks to CLIL (see Table 44: Improved Spoken English Thanks to the English Used in Physics and

Chemistry). In contrast to the previous two items, these questions seek to answer students' perceptions on English in CLIL rather than their perceptions on the FL. Overall, although the numbers are less categorical than in the previous items (lower percentages in the 'strongly agree' category), students are found to be 'undecided' or agree in some way ('agree' or 'strongly agree') in regards to the advantages of having English as the language of instruction in the CLIL section: specifically, their future as students/workers and their speaking skills.

Furthermore, it is important to highlight that only 36,5% of students agreed or strongly agreed with the fact that their speaking skills improved thanks to CLIL Physics and Chemistry, while 65,4% of them agree and strongly agree that having Physics and Chemistry in the FL has resulted in an improvement on their English skills (see Table 22: Physics and Chemistry in English Helps Students Improve Their English Skills). This may lead to conclude that, although students may not be completely certain of whether their speaking has improved thanks to CLIL, they do perceive an overall improvement in their English skills.

Concerning the level of satisfaction with the CLIL section (see Table 19: Level of Satisfaction with the CLIL Section), it could be said the numbers are overall positive with low percentages in the 'dissatisfaction' categories: the highest percentage variable ('neutral') is 35,8%; however, some idiosyncrasies on the numbers for each group have been found (see Chapter 6.1.2) which will be further expanded on the RQ5. In the same line, even though the overall percentage of students who would willingly choose to become part of the CLIL section (45,3%; 47,1% as valid percent) is lower compared to those who would not have chosen if given the choice (50,9%; 52,9% as valid percent) (see Table 20: Willingness to Choose the CLIL Section) these numbers have to be accounted paying attention to the three groups (RQ5). Overall, due to the similarity in the numbers, no general consensus is found on whether these CLIL students would have willingly chosen to become part of the CLIL section if asked.

In regards to the CLIL teacher, he shows a high level of commitment to the CLIL sections and the methodology. Regarding the practical implementation of this dual approach to learning, he shows to have a positive opinion on CLIL (see Interview Question 10) and he focuses on the metacognitive challenges the CLIL methodology may provide to students: according to the teacher, the double work (linguistic and content-wise) makes for a stronger understanding of the subject, though he also points out the simplicity of the contents in contrast to the non-CLIL section. Furthermore, he believes CLIL lessons are more dynamic due to the different exercises he implements to overcome possible language difficulties (see Interview Question 18). Concerning the advantages of the CLIL methodology for teachers (Interview Question 18), practising English and preparing the materials so to be more dynamic are the two main advantages the teacher reported and, even though he mentioned that the material making process gives him much work, he is pleased with its implementation in his lessons.

In addition to these issues, the educational laws concerning CLIL have been accounted in regards to the CLIL teacher's perspective (see Interview Question 11 & 12): concerning the *Decree 79/2010*, the teacher highlighted the importance of educating in context and the presence of English in all geographical spheres of Galician society. Nevertheless, the teacher did not seem to think the *Orde 12 de maio 2011* was considering the role of the teacher effectively and the administration should go a step further to aid CLIL teachers with their classroom practice (e.g. materials). As it has been previously mentioned (see Chapter 4.4), some factors such as the administration may play a role in the teacher's insights on CLIL. In this case, the teacher's perspectives on these issues throw some light on possible problems which may arise in the CLIL practice:

- 1) Administration: as it has been pointed out, the teacher thinks the administration should go a step further and think about everyday classroom activity. For instance,

although he believes the human resources available to the CLIL sections are enough (e.g. language assistants), the administration could bear in mind the centre's profile in order to assign a language assistant with a similar background. Furthermore, although he feels fully supported by the academic staff in his high-school, he mentioned feeling lonely in his teaching practice as he is not in contact with other CLIL Physics and Chemistry teachers. In order to solve this, he thinks the government should boost cooperation among Galician CLIL teachers so to “put on the table different ways of teaching to choose and pick” (see Interview Question 16).

- 2) Materials: according to the interviewed teacher, the creation of materials seems to be the biggest CLIL challenge (as well as the lack of communication among teachers). Overall, he pointed out to a lack of good materials adapted to the Galician curriculum which has led him to use a textbook used by English native speakers and to complete this with adapted materials to fit the Galician curriculum. This has led to him using his personal time to create the CLIL materials following the educational laws.

Despite the abovementioned issues, the interviewed CLIL teacher has an overall positive attitude towards CLIL based on a strong commitment of his teaching role understanding the classroom practice and adapting his teaching to the context. Due to his status as a constant factor during the study, it is important that his positive attitude towards the CLIL methodology does not change over time.

**RQ4: Are CLIL students and the teacher motivated? If so, what type of motivation do they possess?**

Information used to answer RQ4: theoretical framework (Chapter 4) and data analysis (Chapter 6).

In order to answer this question, some issues need to be brought to attention. As it has been previously mentioned, motivation and affective factors may change throughout time so

it is important to bear in mind that the results presented in this study answer to the participants' level of motivation during *Unit 6: Solutions*. Furthermore, it is necessary to differentiate between motivation regarding English (language) and motivation concerning CLIL (methodology).

In regards to the language of instruction, students' perceptions on English as a lingua franca certainly influence their levels of motivation. Overall, they highlighted the strong impact of English in their future job prospects (see Table 41: Knowledge of English so to Find a Good Job) which leads to conclude students are motivated to learn English due to its instrumental (Gardner and Lambert, 1972) and extrinsic (Deci & Ryan, 2000) value: students want to learn English to achieve a separable outcome, that is, to find a job. Concerning this instrumental function of English as a tool in their future professional life, students also showed a positive attitude towards the English they learn in Physics and Chemistry due to the fact that they perceive it as advantageous in their future as students/workers (see Table 43: Learning Physics and Chemistry in English Will Give Students Advantages in their Future as Students/Workers). This comes to prove again how students think of their English learning (in this case, the English learned thanks to CLIL) with instrumental and extrinsic purposes.

However, some instances of integrative and intrinsic motivation are found in students' answers to the questionnaires and the systematic classroom observation. Bearing in mind that language is a powerful social element, it is interesting to see more than half the students use English with their friends (see Table 15: Students Use English with Friends). In this sense, it could be argued that integrative motivation (Gardner and Lambert, 1972) is present if the use of English is understood as a means to 'integrate' themselves with the group, that is, English is used to communicate with their friends. This is also especially significant taking into account the concept of 'learning among peers' which is so common during adolescence. As no separable outcome is to be achieved of this practice, it could be concluded that students



use English with their peers to “to seek out novelty and challenges, to extend and exercise one’s capacities, to explore and to learn” (Deci & Ryan, 2000, p. 70); thus, they are intrinsically motivated. This is further supported by the notes taken during the classroom observation: participation seemed to rise when the teacher asked language-related questions (e.g. translation of keywords) in the three groups indistinctively.

Apart from this uptake on students’ participation due to intrinsic motivation, students’ explicit engagement with the subject thanks to the language of instruction could be categorised within the performance goals in the academic goal theory (Covington, 2000): students engage with the subject through language-based questions in order to outperform their classmates. Despite the fact that competitiveness improved students’ participation in the content subject, students also helped each other (see Chapter 6.3), even though the usual classroom activities did not encourage collaboration. This could be proof of some prosocial goals (e.g. helping others as social behaviour for the sake of the group), though further study would be needed so to make a strong claim on this matter.

It goes without mention that willingness to learn is an important factor to consider in regards to motivation. Focusing on other classroom materials apart from the textbook, most students (69,8%; 72,5% as valid percent: see Table 37: Using Other Materials) admitted to having used extra materials the teacher provided. Therefore, students seem willing to work on the content subject and study from the additional materials bodes well for students’ overall commitment to the content subject and this regulated behaviour could fall into the integrated regulation category within Deci and Ryan’s (2000) self-regulation or extrinsic motivation theory as conscious valuing of the use of these extra materials is related to an external goal, that is, academic achievement.

In regards to the teacher's perceptions on students' motivation, he believes CLIL students are probably motivated by the extra challenge of the FL in contrast their monolingual counterparts, though he highlighted that this would depend on the type of student (academically good or bad students). The fact that the teacher perceives English as a motivating factor is not unexpected as he has said that working with English is motivating to him. In fact, when asked about his own motivation to teach the CLIL sections, the teacher emphasised speaking in English and teaching in English as the main two forces which drive him into his teaching. His desire to improve his English by means of extra-curricular speaking lessons as well as preparing the lessons reports his intrinsic motivation: he pointed out his personal interest in English (see Interview Question 24) and his desire to improve it (see Interview Question 9) which answer to IM-Accomplishment (Vallerand et al. 1992).

Furthermore, the status of English as the language of science also influences the teacher's motivation in using the FL (see Interview Question 24). Apart from this, he also mentioned the type of students in this specific plurilingual CLIL context –academically better than the other option (support group)– as a motivating factor to teach CLIL. These two issues (English as the language of science and the profile of CLIL students) correspond to instrumental motivation as some separate outcomes are found when teaching Physics and Chemistry in English: to use the language for science and not to have students from the support group.

Overall, the CLIL teacher is strongly committed to the use of the FL be it for practical issues (e.g. improving his and students' English) or be it because it is part of the CLIL methodology. Notwithstanding these facts, it is clear the teacher understands the extra work it comes with preparing CLIL lessons (see Interview Question 13) and he admitted his willingness to use his spare time to do so which shows a high level of interest in the students' overall learning experience.

**RQ5: Are there significant differences in regards to motivation and CLIL-based perceptions among the three studied groups? If so, why?**

Information used to answer RQ5: theoretical framework (Chapter 4) and data analysis (Chapter 6).

The two previous research questions (RQ3 & RQ4) have provided an overall picture on the students' and teacher's perceptions and motivations regarding CLIL. Although some of the studied items presented homogeneous results in the data gathered from the three groups (e.g. importance of English in their future as students/workers), some significant differences have been found in regards to the groups. These divergences are proof of the natural idiosyncrasies found in the researched groups: even though the learning experiences for the three groups were similar (e.g. same teacher, academic year, subject and didactic unit), perceptions and motivation may change based on external (e.g. parental involvement) or internal learning factors (e.g. interest in the content subject). Hence, some considerations should be given to the data gathered from each group.

Firstly, it is important to mention the teacher's own uptake on students' motivation regarding students. As it has been previously mentioned, he believes CLIL students are more motivated than their non-CLIL counterparts (RQ4) though he made a point to highlight it may depend on students' level of academic achievement. In regards to the three presented groups, the teacher believes Group A is the more motivated one (even though they do not have such good academic results as Group B) while Group C (the worst academic group in regards to academic results) is the most apathetic regarding the content subject and motivation (see Interview Question 23).

Concerning classroom dynamics and the systematic classroom observation (Chapter 6.3), the teacher's perceptions on the different groups and their level of engagement seem to reflect the classroom reality, though some points on these affirmations should be made:

- Group A: overall, this group were the most participative in the classroom in terms of content-based participation (questions and answers), though code-switching was present in their speech quite often.
- Group B: even though group B was the least participative group, they were quick to answer language-related questions (competitiveness) and their interventions were carried out in English.
- Group C: this group was the worst behaved by far. However, they shared a similar tendency to Group B in regards to their engagement with language-related questions and their language use was similar to Group A (code-switching). Furthermore, they also volunteered quite often to answer the textbook exercises. Nevertheless, it should be also mentioned that the teacher commented Group C's behaviour improved greatly when the researcher was in the classroom.

In fact, the data gathered in the questionnaires point towards some significant differences in the three groups in regards to:

- Experience in an English speaking country: although the numbers for this item may not be overly significant concerning the overall percentage (see Table 19.1), it cannot go unnoticed how Group A shows a higher percentage in regards to visits to an English-speaking country than the other two groups. Bearing in mind that (1) close contact to the target culture is a factor to be considered in integrative orientation (Gardner & Lambert, 1972) and that (2) integrative orientation was to be found in L2 learners who were able to interact with the target culture (Clement, Dörnyei & Noels, 1994; Dörnyei, 1990; Oxford, 1996), it is not farfetched to think that the overall positive attitude of Group A to English and CLIL Physics and Chemistry would be influenced to some extent by this.

- Private English lessons: taking a look at the results from Table 12.1, it is clear that the number of students who attend private English lessons is higher in Group C and Group B than in Group A. It is surprising to some extent as additional contact with English outside mandatory school is likely to result in a higher appreciation of the FL. However, private English lessons could be proof of language-related difficulties; this would explain why a high number of students from Group C (according to the teacher, the worst academic group) attend private lessons, though it would not explain the numbers from Group B.
- Parents' help with the content subject: in regards to parental help in Physics and Chemistry, Group C stands out as the majority of students pointed their parents did not help them with the content subject (see Figure 24). This could be in direct relationship with the previous analysed element (high number of Group C's students attend private lessons) and it could be also related to the fact that most parents from Group C have a basic level of English compared to more homogeneous frequencies in the other two groups (see Figure 23). In contrast to this, Group B has the highest frequency of students who are helped by their parents which may be one of the reasons behind their academic success.
- Watching TV and movies in English: although the data on the use of English among friends were homogeneous in the three groups, this is not extrapolated to other leisure activities such as watching TV and movies in English. In fact, Group C once again stands out as the majority of students from this group do not watch TV or movies in English (see Figure 26) while more than half the students in Group A admitted to watch TV and movies in the language of instruction. These numbers are highly important as they reflect on students' willing contact with the language and they may lead to conclude that close and voluntary contact with the language of instruction play

a significant role in students' perceptions and attitudes towards CLIL. Furthermore, it should be pointed out that the 'individual' nature of this pastime (e.g. students perform this activity on their own and they choose what to watch) may have a strong effect on students' affective filter regarding their viewpoint on English.

- Levels of satisfaction with the CLIL section: in a similar line to the previous analysed items, Group C has special high numbers in the variables which state a low level of satisfaction with the CLIL section (see Figure 29). In comparison, Group A presents higher figures in the 'high level of satisfaction' variables. Curiously, Group B shows a strong tendency towards neutrality on this Likert scale item which could be proof of 'amotivation' in regards to the CLIL experience.
- Willingness to choose the CLIL section: Group C is the least likely to choose the CLIL section if it were optional, Group A is the most likely to choose it and Group B provided similar frequencies to both options. Hence, it may be concluded that the three groups differ greatly on this item. Furthermore, this data complies with the patterns and data found in the levels of satisfaction with the CLIL section.
- Difficulties in Physics and Chemistry due to English: a high number of students from Group C and Group A strongly agreed on the issue that English made the content-subject more difficult. In this case, it could be argued that Group C's perceptions on the FL is influenced by their overall dissatisfaction with the CLIL section or the other way round; the difficulties English brings to Physics and Chemistry results in their dissatisfaction with CLIL. In regards to Group A, it is interesting that while they are the group the most receptive towards CLIL, they perceive difficulties due to the language of instruction, though it does not influence their opinion or their willingness to be part of the CLIL section.

- Improving English by means of Physics and Chemistry: as it has been stated in the previous research question, instrumental orientation in regards to students' perceived English improvement thanks to CLIL is common. This statement is particularly accurate to Group A and B. On the other hand, answers related to this item were not as redundant in Group C (see Figure 32); some significant frequencies (especially if compared to the other two groups) which point out towards a more negative perspective on this are found following the usual negative perceptions on CLIL Physics and Chemistry this group seems to have.
- Language used to ask questions: in this issue, some elements stand out by having a look at the graph (see Figure 39). Group B leans towards using English as the language to ask questions while Group C prefers Spanish. This is not surprising after the systematic classroom observation and the reported language percentages (see Figure 35 & Figure 36).
- Opinion on the textbook: once again Group C's numbers stand out in this item as the majority of students from this group did not like the textbook in contrast with the more heterogeneous results from the other two groups (see Figure 42). This is an element which is to be accounted in RQ6.
- Choice of activities: curiously enough, some Group C' students were the only ones (with the exception of one student from Group B) to mark down any of the lab experiments as the activity in which they learned most English (see Figure 44). This may be related to the type of learners: students who marked these options (lab activities) may be kinaesthetic learners. This would explain to some extent why the textbook (probably more appealing to visual learners) was not liked by this group.
- Level of difficulty for the chosen activity: regarding this issue, only students from Group A and C reported to complete the previous chosen activity with difficulty (see

Figure 46). This resonates with the previous data on ‘Difficulties in Physics and Chemistry due to English’ from these two groups in which students reported that English made Physics and Chemistry more difficult. Although the frequencies are not so high in this item, it is worth mentioning as a pattern seems to arise in regards to Group A and C, that is, both groups seem to perceive more difficulties in the CLIL lesson than Group B.

- CLIL Physics and Chemistry as an advantageous factor for future academic and/or professional endeavours: while most of students from Group A seem to agree with this statement, different numbers are found in the remaining groups: the highest frequencies in Group B and C point to students’ disagreement (or strong disagreement in Group C’s case) on the presented statement (see Figure 49). Even though the majority of students agreed on the instrumental importance of English (see Figure 48), having Physics and Chemistry in English is not considered a relevant factor for future academic and professional endeavours in these two groups.
- English in Physics and Chemistry as a way to improve students’ spoken English: following their overall negative perceptions of CLIL, most of Group C’s students believe their spoken English has not improved thanks to CLIL (see Figure 50).

Overall, this analysis of the results by group allows for a deeper understanding of students’ perceptions and motivations towards CLIL. Broadly speaking, it seems Group A is the most positive in regards to CLIL Physics and Chemistry and they show some instances of intrinsic motivation as well as integrative orientation. Instrumental orientation is found in Group A and B. Furthermore, this last group is strongly focused on academic achievement so it was only natural to find that academic goals were present in Group B’s students’ behaviour and questionnaires. In contrast to these two groups, Group C presents a completely different attitude to CLIL with some outright negative perceptions (e.g. textbook opinion), though



some elements (e.g. participation) were found which may lead to think that there is a somewhat stronger engagement with the CLIL subject than what the questionnaire results show.

**RQ6: What elements should be revisited in order to improve the CLIL section in regards to motivation?**

Information used to answer RQ6: data analysis (Chapter 6).

According to the CLIL teacher, good and adaptable classroom materials for CLIL (specifically, the textbook) have been found lacking in Galicia and Spain. This has led to the adaptation of an American textbook (used since the beginnings of the CLIL section in this high-school) by means of handouts and lab practices in order to comply with the Galician curriculum. Students' opinion on the textbook varies depending on the group (see Figure 42) with Group C showing an overall dislike for this didactic material. Concerning the other two groups, although they showed a tendency towards 'liking' the textbook, most of them were undecided on this issue. This leads to think that the textbook could be exploited to enhance participation and engagement with the CLIL subject.

Apart from the textbook, other activities were presented by means of handouts (e.g. solution-concentration problems) and the lab activities (e.g. making a solution). Overall, students seemed more engaged with the lab activities than the handouts and the textbook exercises (e.g. exchanging ideas with their partners, working collaboratively), though they were more focused on the textbook activities, probably due to the fact they had to work individually and they were in their usual classroom. Concerning the questionnaire results, the majority of Group A's answers (N=12) could not be used in the final score due to students' misinterpretation of the statement; hence, the achieved results focus mostly on Group B and Group C's opinions.

Overall, students believe the activities in which they learned most English were the ‘Check and Apply’ exercises while other activities from handouts and lab reports were considered the activities in which they learned less English (see Chapter 6.1.3). As it has been previously mentioned (RQ5), Group C somewhat differs from the previous statements as some students from this group chose one of the lab activities as the activity which helped them learn the most of the FL (see Figure 44). These differences among groups should be taken into account in order to understand how lesson planning and activity planning could influence students’ interest in the activities and the idiosyncrasies (e.g. types of learners) of each group.

Furthermore, language is an obvious element which needs to be considered. Most students pointed out that their previous worries (see Figure 33) concerning the CLIL subject was that they were not sure they would understand it due to language barriers. Even though most of these worries were forgotten once students had some time to acclimatise themselves to the CLIL subject (see Figure 34), some of the disadvantages students highlight are language-related (e.g. content specific language).

In a similar line, students’ language use could be improved in terms of motivation. During the systematic classroom observation, the TTT (Teacher Talking Time) exceeded greatly the STT (Student Talking Time): this is related to the fact that the STT was reduced to one-worded or short answers as well as some questions. However, the nature of the subject (scientific-problem solving) caters to this type of interactions in the presented Physics and Chemistry exercises (e.g. students only need to provide one number when solving calculation-based exercises). Therefore, a possible solution (to be further developed in Chapter 7.2) is to prepare more collaborative exercises (e.g. in pairs) so students could speak more and practice English. Taking into account the social nature of the classroom and possible prosocial goals (Covington, 2000), students would improve their interest in the

subject and probably feel more motivated by working together. Nevertheless, it should be also considered that the majority of students used Spanish in group activities (see Figure 40), so it is necessary to work on this issue and boost FL use in collaborative works.

### **7.2. Proposed Guidelines**

In order to answer Aim 3 (proposed guidelines to improve motivation in this specific CLIL classroom), the systematic classroom observation has been a great source of information as students' interaction with the materials and the teacher's explanations provided relevant data. Furthermore, some of the items from the questionnaire allowed for a deeper understanding of students' IDs (individual differences) regarding the classroom practice (see Chapter 6.1.3). Although several different approaches could be taken in order to improve motivation in the CLIL section, these guidelines focus on four aspects which could have a direct impact on this issue:

- 1) Materials and Task Design
- 2) Language
- 3) Classroom Dynamics
- 4) Pluriliteracies Teaching for Learning

The following pages expand on these topics by paying close attention to the studied classroom reality. Furthermore, it is necessary to note these are mere guidelines to improve what it has been studied in the CLIL classroom with no desire to criticise in any way the CLIL teacher's work.

- 1) Materials and Task Design

In order to engage students, the presentation of didactic materials is almost as important as the materials themselves. Bearing this in mind, it is necessary to engage students at the beginning of the didactic unit, hence, the warming-up exercises should be reviewed. In this case, the teacher started the unit by explaining the title of the unit and what students

would have to do (e.g. laboratory practice, reading comprehension exercise): he does this in every unit. This type of input is certainly favourable to avoid anxiety towards the unknown (in this case, the assessment of the unit) and it cannot be forgotten that “[u]sing routines so students can predict what will happen is an attribute of CLIL” (Mehisto et al., 2008, p. 175).

However, the first sub-stage of the learning process (‘meeting input’; Coyle et al., 2010) could be improved by introducing a warming-up exercise in all the lessons which may draw students’ interest into the content. For instance, the concept of ‘solution’ (first lesson) could be introduced by a practical experiment in the classroom related to students’ daily lives (e.g. the teacher could ask students to help him make mayonnaise so they would have to categorise the ingredients and they would see how to solution came to be) as “[c]onnecting with learners’ lives presupposes that we create a safe and enriching learning environment, where students gain new knowledge about themselves and the world they live in (Mehisto et al., 2008, p. 179).

This type of activity would allow the teacher to present familiar content and language in a visual and kinaesthetic way; thus, engaging students in the learning process. Furthermore, this would answer to the content and language familiarity and novelty continuum (Coyle et al. 2010, p. 95) as students would be familiar with the content and the language before introducing new language (e.g. ‘dissolve’, ‘solution’).

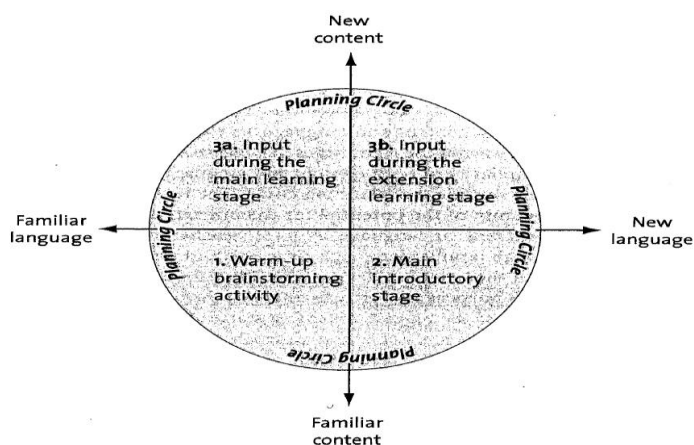


Figure 53: Content and Language Familiarity and Novelty Continuum. Coyle, Hood & Marsh 2010: 95.

Following this continuum could enrich the learning process and cater to the cognitive demands of the content and language. These patterns provide a view of the learning process by stages in which the input slowly grows in difficulty; thus, scaffolding of content and language is used in the sub-stages of ‘meeting input’ and ‘processing input’ as “the understanding what the input material offers is only possible if the learner has the vocabulary, syntactical understanding and reading skills to construct the meaning of the text [or any other type of input] before engaging in a task which uses it” (Coyle et al., 2010, p. 98).

Concerning the types of input students received, these were mainly textbook explanations while the handouts served as reinforcement activities. The former were presented by the teacher following the structure of the textbook and were interspersed with small in-classroom experiments (e.g. mixing salt and water) as well as some hand-made diagrams (e.g. drawings of different solutions in test tubes) which were displayed on the digital board. Overall, students seemed interested when the teacher performed the experiments and showed them the graphical explanations on the whiteboard; therefore, the use of these resources in the classroom could be exploited in greater measure so to cater to students’ interests. Following this line of thought, the fact that students paid more attention to the in-classroom experiments and the explanations on the digital board are probably related to the following issues:

1. Having the same input but presenting it in different ways (e.g. visual and auditory) would reach a bigger ‘audience’, that is, learners process input differently and an heterogeneous presenting of the input (in terms of how it is presented) would cater to different types of learners.
2. It should be accounted that these groups of students belong to the so-called ‘technology generation’: they are used to work (and entertain themselves) with

computers and laptops so it is only normal that they would pay attention when these are used in the classroom.

However, this does not mean that the more analogical resources should be set aside and the ‘technology trap’ (Mehisto et al. 2008, p. 192) should be avoided. In this regard, the digital board should be used oftener in the CLIL lessons, but giving it its due: use it when necessary. The CLIL teacher uses the digital board to show graphic explanations as well as to show the answers to the exercises in the handouts. This could be improved to ‘process input’ and ‘produce a response’ as follows:

- Use different authentic materials found on the Internet (e.g. videos) to complete the information from the textbook or provide the same input in a different way (e.g. how to make a solution).
- Allow students to use the digital board to answer the exercises (e.g. use a PPT with animations to correct the exercises and one student would handle the touch screen).
- Turn some of the exercises from the textbook (e.g. fill in the blanks exercises) into online exercises. Bearing in mind students’ opinion of the textbook (see Figure 42), it could be interesting to see whether students’ opinion relies solely on the textbook contents or on the textbook itself as a didactic tool.

These measures would not represent a significant change in the content, but in the way the content is presented and the type of input. In this case, these guidelines consider as well to some extent the role of students in their own learning bearing in mind “the issue of ‘teachers doing too much’, leading to learner boredom, surface-level learning and the potential for anxiety generated when teachers demand too much too quickly” (Coyle et al., 2010, pp. 98-99). Therefore, students should become the centre of their learning experience as much as possible.

In order to accomplish this and to further engage students, the final task (lab experiment and report) could be refashioned to encourage interest, use of English and student-centric work as follows: students video record the lab experiment (with previous parental consent) and the results will be uploaded by the teacher to the high-school webpage having considered that “[s]tudents tend to take greater care and pride in their work if it is displayed” (Mehisto et al., 2008, p. 178). This would allow for students to reflect on the steps to follow, to work collaboratively and use English to record the video, thus, boosting the use of English in group activities which it is quite low according to the questionnaire data (see Figure 40).

In regards to the Galician context, although there are several publishing companies which provide didactic materials for CLIL, the interviewed CLIL teacher pointed out that most of these textbooks were badly translated copies of Spanish textbooks and they did not take into consideration the Galician curriculum, thus, leaving a void in the teacher’s teaching practice. In order to fix this situation, the teacher has prepared some materials himself to accompany the American textbook. However, this may not be possible as a long-term solution to all Galician CLIL teachers, so the administration could encourage the creation of CLIL materials in Galician publishing houses with external consultants (FL experts): this would provide CLIL teachers with appropriate and adapted CLIL materials to use in their lessons.

## 2) Foreign Language

It is indisputable that FL (in this case, English) is a key element in the running of the CLIL classroom. Taking into account the fact that language was the most common element to be reported in regards to ‘worries at the beginning of the CLIL section’ (see Chapter 6.1.2) and ‘disadvantages of the CLIL section’ (see Chapter 6.1.4), these language concerns should

be addressed. As it has been previously mentioned (see Chapter 6.3), the CLIL teacher deals with the FL in an explicit manner and students seem to be engaged when answering language-related questions. Regarding the pre-teaching of language, Coyle et al. (2010) write that “CLIL teachers must allow the subject to emerge in the same way as it usually would despite the role of the other language. Pre-teaching of specific language in ‘language teacher mode’ is often not the best practice” (2010, p. 92).

Although the teacher does not ‘pre-teach’ the language (he deals with new or tricky vocabulary when it appears naturally during the lesson), this is explicitly worked on by students (usually by means of translation). However, the translation of terms (specific vocabulary), though useful to address language concerns at the moment, may not provide long-lasting learning (e.g. students may forget the word). Therefore, in order to work with the specific language in an engaging way and understand this in a deeper level, the usual teaching practice could include some activities which would involve students with their content-specific vocabulary (an issue found in the reported ‘disadvantages of the CLIL section’). Some options could be:

- Dictionary of terms: students may create their own list of terms used in the Physics and Chemistry lessons; this would help them integrate these into their language repertoire and they would have a reference list to study/work for the content subject.
- Noticeboard word cloud: as a collaborative activity, students would add specific vocabulary they used in the classroom in post-it notes to the noticeboard word cloud at the back of the classroom.

These two proposals differ in the approaches they take; while the first one is based on individual work (each student writes their own dictionary) the second one puts forward a collaborative task, that is, the language word cloud is created by all students. The first alternative caters to a more individual type of learning bearing in mind students’ learning



pace while the second one promotes collaborative learning and relies to some extent in the social nature of the classroom; thus, catering to possible prosocial goals (Covington, 2000).

Despite the specific vocabulary, students reported that the level of English needed in order to complete the activity in which they learned more English (see Figure 44) was an intermediate level (see Figure 45). As it has been previously mentioned, the fact that the majority of students did not think they needed a very low or a very high level of English for this exercise is positive as it resonates with the ‘i+1’ language level, that is, language level which is “just above the current language competence level” (Coyle et al., 2010, p. 91). Therefore, foreign language did not seem to be a problem in regards the completion of activities. However, some students (Group A & Group C) also pointed out the fact that English made the Physics and Chemistry lessons be more difficult (see Figure 31). Hence, it is possible that these two groups would benefit from some reinforcement in regards to English. According to the *Orde do 12 de maio* (2011), “students could attend two periods per week of language reinforcement outside their official timetable [my translation]” (2011, pp. 10349-10350), however, only a more specific study on the topic could answer whether this proposal (implementing reinforcement periods) is of outmost necessity in this case.

Although code-switching (English-Spanish) was present during students’ speech, this should not be considered a negative type of output. Bearing in mind that usual code-switching practice appears in bilinguals (e.g. Spanish-Galician), it could be very telling that students switch between English and Spanish. Trying to encourage language and communication without ‘penalising’ in any way code-switching would make students more comfortable with the language in order to use English more fluently over time. Following the concept of ‘translanguaging’ (Cummins, 2016) and the CLIL teacher’s practice, the use of Galician and Spanish in the classroom could turn to be very positive as using two languages (and realities) provide students with different input (e.g. ‘Funnel, like Galician *funil*’).

### 3) Classroom Dynamics

As it has been mentioned, classroom dynamics differ among the three studied groups (see Chapter 6.3.). For instance, Group C stands out in the classroom dynamics due to their unruly behaviour, a possible activity which may help with this issue relies on the idea of creating classroom rules and norms: “Students can better manage their own behaviour when they develop and agree on classroom norms, rules or principles of behaviour to help them learn” (Mehisto et al., p. 172). This would give students some control over the classroom dynamics and being aware of the limits would help them follow the rules.

Most of the problems of behaviour in these groups were based on students’ talking to each other. As it has been said, planned collaborative work only occurred in the laboratory where behaviour was not an issue. It is highly likely that students’ engagement with the lab activities were based on (1) their ‘hands-on’ approach and (2) the teamwork experience. As all the groups worked consistently and they accomplished their tasks without misbehaving, these are strong points to consider introducing collaborative-focused activities in the usual Physics and Chemistry classroom. The introduction of this type of activities would cater to (1) increase STT, (2) focus on peer-led learning, and (3) exploit ‘learning among peers’ so common in these affective stages:

Encouraging students to assist one another and share with one another takes some of the pressure off the learner and the teacher. It helps bring new perspectives to bear and makes it easier for students to stay on task. It also fosters independence and encourages students to help one another. It contributes to building the co-operative and supportive classroom culture needed for CLIL. (Mehisto et al., 2008, p. 177)

Overall, the implementation of more collaborative tasks in the lessons would boost the prosocial goals (Covington, 2000) which have already been found (to some extent) in the studied groups (see RQ4): the collaborative nature of these activities would promote a sense

of belonging and the desire to perform well for the group's sake, especially if specific roles are assigned to each member of the group (or pair). This desire to perform well could be exploited taking into account students' competitiveness (especially Group B in regards to language-related questions) and their performance goals. However, it has been pointed out that performance goals cater to a type of superficial learning, hence, learning goals would be more favourable in order to improve competency, understand and be interested in the learning subject (2000, p. 175).

Even though learning goals may be more difficult to implement than performance goals (due to their intrinsic cognitive nature), Covington's (2000) sequence of *goals* → *cognitions* → *achievement* could be put into practice by making students aware of this process. For instance, the CLIL teacher starts up the didactic unit by paying attention to the objectives in the textbook; this could be broadly adapted to the sequence as follows:

- The teacher explains the goals of the unit/lesson and why these are relevant.
- The input phase is drawn following the familiarity and novelty continuum (see Figure 53).
- Students produce the stimulated output.
- Students reflect on whether they have accomplished the goals (e.g. fill in a 'yes-no' table chart with the goals).

Students' personal sense of accomplishment when reflecting on the achieved goals would lead to a more positive attitude to the tasks as they would appreciate their progress in a more explicit manner. Therefore, intrinsic motivation (Deci & Ryan, 2000) and IM-Accomplishment (Vallerand et al., 1992) (see Chapter 4.1) could also be improved by following Covington's (2000) sequence in CLIL Physics and Chemistry.

Overall, the proposed guidelines in regards to classroom dynamics are based on the fact STT should be improved by means of pair work or collaborative activities so students

would become more involved in the learning process. Hopefully, this would lead to a rise in motivation (learning and prosocial goals as well as intrinsic motivation) which would result in positive perceptions on CLIL and better academic results.

Nevertheless, the Galician educational laws should be considered, particularly the *Orde do 12 de marzo* (DOGA, 2013) as it establishes the student ratio of 30 students (maximum) per group in secondary education. This high ratio of students coupled with the usual 50-minute periods in secondary school may make the implementation of communicative activities in which all students participate challenging. Although the best option would be along the lines of lowering the ratio of students, this issue could be tackled by proposing pair or group work activities with the teacher being ‘not a sage on the stage but a guide on the side’; thus, STT would increase and students would become the centre of attention in their own learning experience.

#### 4) Pluriliteracies Teaching for Learning

As it has been previously mentioned, the implementation and adaptation of CLIL has been met in positive and negative terms. Similarly, research has proved that CLIL students have achieved overall positive results, though there are some issues which need to be improved (see Chapter 2.3, Chapter 3.4 & Chapter 4.4). In order to address some of these issues, Pluriliteracies Teaching for Learning (PTL) was developed:

Pluriliteracies Teaching for Learning (PTL) is an approach to learning which has been developed in the course of a project for the European Center of Modern Languages (ECML) in order to address conceptual and methodological shortcomings and problems identified by Content and Language Integrated Learning (CLIL) researchers and practitioners. (Meyer, Imhof, Coyle & Banerjee, 2017, p. 238)

This conceptual framework to improve CLIL shortcomings provides some pointers which could improve the studied CLIL sections. Taking into account that “knowledge acquisition is

a process of meaning-making for understanding and acting in the world” (Meyer, Coyle & Schuck, 2017), students’ engagement with their reality should be taken as a key aspect in their learning process. PTL establishes deeper learning in CLIL by not only paying attention to the linguistic and cognitive dimensions, but also to the social role of learning and education.

Education does not exist on its own as a separate entity to society, but it evolves around it. Therefore, connecting learning to learners’ life:

[P]resupposes that we create a safe and enriching learning environment, where students gain new knowledge about themselves and the world they live in [...] If we can engage students in applying new learning through the creation of meaningful result, they are more likely to consider the learning relevant. (Mehisto et al. 2008, p. 179)

Although it may not be possible to connect students’ reality to the content subject due to the subject’s requirements (e.g. problem-solving exercises), the teacher’s attempts to bring examples from students’ daily lives (e.g. ‘Coca-Cola’, chocolate with milk) were received positively in terms of interest and engagement so this is an option which may be worth exploring.

In regards to self-reflection, this is considered “both a way of learning and a goal for learning” (Meyer et al. 2017, p. 244) and is related to self-regulated learning. These concepts have been briefly dealt with in the study (see Chapter 4), but some further thought need to be given to this in regards to the classroom reality. Furthermore, these elements are tightly linked to affective factors in the sense that:

Successful self-regulated learning needs students to understand how to set adequate goals for themselves, how to plan a learning episode including, selecting learning strategies, to monitor reiterating goals when they meet difficulties and errors

(Heemsoth and Heinze 2016), and to adapt their learning and study behavior accordingly. (2017, p. 244)

In order to cater to this, it is important to make students aware of their own learning process and the different learning strategies they have at their disposal. In this line, students should be provided with different useful tools to work and study with as well as becoming adept at handling negative outcomes (e.g. frustration when not understanding). In order to do this, some issues worth implementing are:

- Emotional lexis (Mehisto et al., 2008, p. 185): students should be given the tools to express their emotions as “an emotional lexis is a valuable tool in helping individuals to manage both their positive and negative emotions within a group dynamic” (p. 185).
- Accepting mistakes as part of the learning process: using students’ mistakes to prove a point should be done with utmost care. For instance, the teacher may explain why that mistake was led to be made (e.g. some cognitive process may have led them to make a mistake).
- Associating the new information (unfamiliar) with something pleasant (2008, p. 175): taking as a starting point that the unknown is often a cause of stress and even anxiety, some worries may appear when starting the CLIL section (see Chapter 6.1.2) and facing a new CLIL unit. As it has been previously mentioned, some warming-up could erase some of this tension, especially if this exercise considers students’ previous knowledge as “seeking opportunities to associate new learning with current knowledge, with something interesting and challenging, while still feeling safe, will decrease time wasted on resistance to new learning and increase student success” (2008, pp. 175-176).

- Boost peer-feedback and self-assessment: having looked at the importance peers have on students' behaviour, it is possible students would become more engaged when given peer-feedback. In this line, Meyer et al. (2017) add the mentoring dimension to their PTL model so to design "deeper learning ecologies where mentors and mentees are engaged in the processes of constructing and communicating of knowledge" (p. 241). Furthermore, "[o]ne aspect of fostering motivation is the encouragement of positive retrospective self-evaluation as part of a focus on dynamic continual development, whereby goals are set, reviewed and progress noted" (Coyle et al., 2010, p. 89). Therefore, peer-feedback and self-assessment are two elements which would enhance engagement, if not motivation; this could be achieved by providing students with self-assessment questionnaires at the end of the unit or by asking students to correct their peers exercises in the classroom (while the teacher provides the answers).

In addition to this, the concept of 'self-efficacy' should be also dealt with in the sense that "[s]elf-efficacy has an impact on the long-term and short-term choices individuals make, on the persistence in the face of task difficulty, on the willingness to invest effort, and on the self-evaluation after completing a task" (Meyer et al., 2017, p. 243). This could be linked to the concept of the 'ideal self' (Gu, 2009) as self-efficacy is defined as "a strong belief in one's ability to solve a problem and the expectation to succeed in a task" (2017, p. 243); thus, the internalisation of their abilities is part of the ideal self. Hence, by putting emphasis on what students are able to achieve, their ideal self would focus on their accomplishments; thus, leaving room to expand their list of 'accomplishments'. As a practical exercise to work on their concept of self-efficiency, the learning standards of the Physics and Chemistry curriculum could be adapted into 'I can' statements (e.g. 'I can differentiate homogeneous and heterogeneous mixtures') which students would write on their notebooks as they advance

in the subject so they would be aware of the goals they have accomplished so far; thus, boosting their motivation and working on their critical thinking by doing this self-assessment.

To conclude, these guidelines deal with some issues which have been observed in the classroom and the questionnaire results. Overall, these guidelines focus on methodological aspects rather than content-based aspects which can be easily introduced in the studied CLIL sections. Furthermore, some of these aspects (e.g. ‘familiarity and novelty continuum’) should be accounted in all CLIL sections, not only the three studied groups. As a final remark, it has been noted that close contact with the target culture and meaningful (relatable) learning would improve students’ motivation (see Chapter 4). Therefore (and bearing in mind the plurilingual nature of the studied high-school), a school trip to an English-speaking country with science-based activities (e.g. Natural History Museum) could influence and enhance students’ integrative orientation (Gardner and Lambert, 1972): they would be immersed in the target culture (especially Group B & C: see Table 9: Experience in an English-Speaking Country). However, this suggestion has not been made in the general guidelines of the study due to possible financial and administrative reasons due to the fact that the proposed guidelines seek to follow the principle of CLIL as a non-elitist methodology and education as a homogeneous social force.



## **CHAPTER 8: CONCLUSIONS**

The last chapter of this study endeavours to reflect on the main findings of this research project both theoretical and practical (8.1). In order to do so, the theoretical framework used in this study needs to be mentioned inasmuch as it is related to the data gathered in the study. Furthermore, some limitations of the study (8.2) are considered so to contextualise the study within its reality (e.g. high-school and classroom observation). This is followed by some pedagogical implications (8.3) which have been brought about the study's results and the proposed guidelines. Finally, further lines of research (8.4) are presented in order to explore the results from different angles and achieve a deeper understanding of the CLIL practice in terms of students and teacher's perspectives and motivation in Galicia.

### **8.1. Summary of the Results**

The sociolinguistic Galician context is defined by the official bilingualism of the autonomous community. The different Galician laws promote the use of Galician and Spanish, but foreign languages have also been introduced in the educational curriculum being the *Plurilingual Decree 79/2010* the most recent law to regulate the languages of instruction in mandatory education. Encouraged by several European organisations, foreign language learning has become a reality and initiatives such as CLIL have taken root in Galicia in ever expanding numbers (Villar, 2016, 2017). In regards to language use, the participants of this study (students) were mainly Spanish-speakers with only a small percentage reporting to use Spanish and Galicia at home. Despite the fact that most of them are not 'active' bilinguals in the official languages, students showed a high regard for the English language.

Learning English and practising it are the main forces behind students' motivation in regards to the CLIL section. This is in close relation with instrumental orientation (Gardner & Lambert, 1972) as it has been found that students believe knowing English is important due

to its presence in the world (*lingua franca*) as well as in their future as students and workers. This points towards instrumental orientation as well as extrinsic motivation (Deci & Ryan, 2000) in regards to learning English. Furthermore, the use of English as a social phenomenon is also found in the three groups related to non-academic ‘peer to peer’ speech which bodes well for the integration of English in non-academic contexts and its further implementation not only as the mandatory FL but as a language worth using outside the FL and CLIL classroom. Interestingly enough, this non-academic uptake on English is reported in peer interaction (using English with friends), but the numbers are not that sound in the reported use of English in ‘individual’ situations (e.g. watching TV in English).

In regards to perceptions, the levels of satisfaction with the CLIL section are overall high as well as the willingness to choose the section if it were optional (except Group C). It is also significant that these data are compared to other ‘perceptions’ such as the content subject level of difficulty due to the language of instruction: a high number of students believe English makes the content subject more difficult (Group A & C). In regards to the CLIL teacher, he assessed his CLIL experience as overall positive and his commitment to the CLIL section is obvious in his answers regarding the willing extra preparation of the lessons.

These perceptions are certainly influenced by the teacher’s motivation concerning English as he admits that learning and practising English are motivating elements for him (intrinsic motivation: Deci & Ryan, 2000). Furthermore, he emphasises the need to teach in context (e.g. knowing English as a necessity in Galicia) as well as the suitability of Physics and Chemistry due to its scientific nature and the role of English and the language for science; thus, instrumental orientation (Gardner & Lambert, 1972) is also present within the teacher’s affectivity. Overall, his positive attitude towards CLIL is in line with other studies on the topic (Infante, Benvenuto & Lastrucci, 2009; Méndez García, 2014; Pladevall-Ballester, 2015; Pérez Cañado, 2016; San Isidro, 2017).

Nevertheless, some issues on the classroom practice and the received institutional support were mentioned:

- **Materials:** lack of good adapted materials to the Galician curriculum is perceived as the main challenge to the teacher as he needs to adapt and create these materials. This has an impact on his spare time and, although he mentions his interest in working with these outside of high-school, this could end up being a challenge to his motivation and CLIL perceptions in the long run.
- **Institutional support:** although the teacher feels supported by the academic high-school staff, a lack of institutional support in regards to the classroom reality has been mentioned by the teacher in regards to the autonomous administration and the laws related to CLIL. Even though he admits there are positive elements to the law and its implementation (e.g. educating in context, human resources, training programmes such as PIALE), issues such as teacher's 'isolation' (not being in contact with other Galician CLIL teachers), the inadequate use of the human resources (not taking into account the high-school profile when assigning language assistants) or the lack of appropriate materials are some of the concerns the teacher voices, not as much as for himself but because students "deserve more than this" (see Teacher's Interview Question 17) .

Concerning the systematic classroom observation, despite the groups' idiosyncrasies, one pattern stood out in the three studied groups: engagement with the target language. Bearing in mind that the subject of study (Physics and Chemistry) does not encourage an overall spontaneous use of the language as other subjects due to its formulaic nature, it is significant that students interact with the FL. Apart from the common language use when answering questions or exercises, the language of instruction is often presented implicitly (e.g. teacher's explanations) as well as explicitly (e.g. teacher explains grammar item). During the

classroom observation, content-specific vocabulary was emphasised by the teacher by means of asking students to translate these words: students answered positively and even some of the less participative students joined in and answered. Students were engaged in giving out the answer as fast as they could, so some competitiveness could be appreciated. Furthermore, it is significant that this happened in the three groups where students' perceptions and motivation are somewhat different.

In fact, heterogeneity among the groups is one of the key factors which have been considered and studied. Despite the fact that the external events (e.g. didactic unit, materials, Physics and Chemistry teacher) remained the same for the three groups, some differences were found, especially concerning Group C and the other two. As it has been previously pointed out (see RQ5), the three groups differ in several aspects which have led to conclude that:

- Group A students are predisposed towards thinking about the CLIL section in positive terms despite the fact that they also report difficulties/challenges concerning the use of English in Physics and Chemistry. Overall, this is the group with a higher level of integrative orientation as well as the typical instrumental orientation found in all groups.
- Group B stands out for their instrumental orientation in regards to both English and the CLIL section. Besides, they are the group the least concerned with English as an extra challenge to Physics and Chemistry.
- Group C differs from the two previous groups. Even though they present interest in learning and knowing English due to instrumental reasons, their perceptions of the CLIL sections (e.g. levels of satisfaction, improvement in their speaking skills) are

overall negative. This may be contextualised within this group's overall amotivation towards academic endeavours.

It is important to mention that the language of instruction (English) is both considered a 'blessing' and a 'curse' in the sense that it has proven to be a motivating factor for the teacher and students but also as one of the elements students feel make the content-subject more difficult and the CLIL teacher to 'simplify' the content. It must be accounted that the presence of CLIL in Galicia is quite a recent phenomenon in terms of educational time and, even though the studied groups belonged to a plurilingual centre, the study was carried out in their second year of high-school.

## **8.2. Limitations of the Study**

First of all, it is important to point out that CLIL in Galicia is a recent phenomenon as this reflects not only on the results of the study but also the state of the art. As it has been previously mentioned, educational measures and projects take time to take root. Although using a language of instruction other than the MT may not be a new concept, CLIL goes a step further than the mere use of a FL in a non-linguistic subject and some considerations should be made in its implementation (e.g. Coyle's 4 C's). This has posed a challenge in the running of CLIL sections with the Galician laws (*Plurilingual Decree 79/2010, Orde do 12 de maio 2011*) mainly focusing on the linguistic aspects of the methodology. This coupled with the lack of teacher training based on CLIL (not the language) has resulted in different classroom realities in regards to methodological terms.

Despite the fact that some literature and research on CLIL in secondary education has been carried out (Bobadilla Pérez & Galán Rodríguez, 2015; González Gándara, 2015; San Isidro, 2009, 2010, 2017), further research is needed in order to understand the diverse in-classroom situations of CLIL in the autonomous community. Furthermore, this research has

only focused on bilingual centres and differences between CLIL and non-CLIL students. Bearing in mind the current CLIL panorama in Galicia and the ever-increasing numbers of plurilingual centres, CLIL research in plurilingual education should be promoted. So far no studies of plurilingual centres in Galicia related to CLIL have been carried out; hence, this study had to face the lack of research on the topic by reviewing the research done up to the moment in regards to bilingual centres.

On a more practical note, the timing of the study and the classroom observation posed some limitations: the classroom observation took place in the middle of the second trimester during both academic years (2016-2017, 2017-2018). As other studies have shown (San Isidro, 2017), the time of the data gathering process plays a role in the results as affective factors fluctuate over time, thus, the results may have varied depending on the time the questionnaire was provided to students. However, the timing had to be adapted to the CLIL teacher's planning as well as the researcher's availability to carry out the systematic classroom observation.

Some of the main limitations of this study were found during the systematic classroom observation. Due to the fact that video recordings were not possible (DOGA, 1997) and audio equipment would not record all the sounds in the classroom due to the classroom size, notes and transcripts had to be recorded by hand. Moreover, due to the scientific formulaic nature of the subject, much of the transcribed materials were one-word items which do not present much of students' language use. Furthermore, the humble number of students partaking in the study answers to the high-school's enrolment data in the two years defined by a low number of 2° ESO pupils in the 2017-2018 academic year. To conclude, it has to be pointed out that the Physics and Chemistry teacher was the only willing teacher in the studied high-school to participate in the study: this is quite telling regarding

teachers' usual reticence to allow people into their classes, a fact which should be given further thought for the sake of CAR.

### **8.3. Pedagogical Implications**

One of the aims of this study (Aim3) dealt with some pedagogical measures which could be implemented in the CLIL section in order to improve motivation. In this regard, several issues have been pointed out related to the teacher, classroom dynamics and students. First of all, according to the data gathered from the interview, educating in context is an element which is present in the teacher's mind. However, this has to go a step further from simple acknowledgement. In order to do that, the administration should work on adding some issues to the theoretical framework already present such as teacher support and measures clearly directed to the classroom reality so to relate content and context to the CLIL experience. One of the major concerns of the CLIL implementation in Galicia is the insufficiency of CLIL-based teacher training. Although programmes such as PIALE promote language learning (and practice) among CLIL teachers, it cannot be forgotten that CLIL – despite being a dual-focused approach (content and language)–, does not merely rely on these two concepts. Therefore, further training is needed so to make teachers aware of what CLIL stands for from a closer perspective than the one given by the *Orde do 12 de maio (2011)*.

Concerning the classroom dynamics and the principles of CLIL, it has been pointed out that it could be improved by boosting collaborative learning through pair work or group work activities. This answers to the idea of interpersonal learning (Gardner, 1983) besides individual learning as a meaningful type of learning but also to the importance communicative competence has received in the last decades from European institutions (CEFR, 2001) and FL-based methodologies (e.g. CLIL). Nevertheless, this encouragement towards collaborative work and communication in the CLIL classroom need to be understood

within the classroom context. As it has been pointed out, the high ratio of students per class in mandatory secondary education in Galicia (*Orde 12 de marzo de 2013*) does not foster these methodological approaches so teachers often have to face this reality when implementing communicative and collaborative activities.

Moreover, students should be the central point of the learning process and further thought needs to be given to CLIL students in regards to the extra ‘challenges’ this methodology may pose. In this line, students’ different learning paces as well as their IDs should be accounted in the CLIL classroom. Having considered how students’ interests and context play a role in their perceptions and motivation, it is important to make students feel they have a voice (and some control) within the CLIL classroom. In order to do that, some measures have been proposed (e.g. peer-to-peer learning, feedback: see Chapter 7.2.) with a strong focus on students as the makers of their own learning.

#### **8.4.Further Research**

Overall, further research on CLIL in Galicia needs to be made in order to understand the impact and implementation of CLIL in this specific sociolinguistic context. Although some studies have been carried out regarding Galician CLIL in secondary education (Bobadilla Pérez & Galán Rodríguez, 2015; González Gándara, 2015; San Isidro, 2009, 2010, 2017), the diverse educational panorama and the growing implementation of bilingual sections needs to be studied in a broader context. Concerning this new reality, plurilingual centres and their CLIL sections have not been studied so far; bearing in mind that educational research should cater to the classroom reality as much as possible, it is important to study CLIL sections in plurilingual centres as well as continuing with the research done so far in bilingual centres.



Regarding the sociolinguistic situation in the autonomous community, it could be interesting to study students' and teachers' attitudes and perceptions regarding CLIL in 'active bilinguals'. So far, only two studies on this issue have been done in Galicia: San Isidro's (2017) study focused on the attitudes Galician speakers in a rural high-school had to CLIL while this study focuses on Spanish speakers in an urban high-school. Therefore, studying a different third set of participants (active bilinguals) would provide a more comprehensive view of how the MT could influence students' (and teachers') affective filters. In this line, other issues on affective factors and bilingualism should be studied:

- Bilingualism and executive function (Bialystok & Barac, 2013): as it has been mentioned (see Chapter 4.2), inhibitory control may allow CLIL students to overcome bouts of frustration in order to reach their content-related goal though some further research needs to be carried out.
- Translanguaging: the use of the MT in the classroom (Gené Gil, Juan Garau & Salazar Noguera, 2012; Méndez García & Pavón Vázquez, 2012; Li & Yi Lo, 2017) and CLIL code-switching in Galicia (San Isidro, 2017) have been studied. However, some thought needs to be given to the concept of translanguaging in Galician CLIL settings bearing in mind the cognitive issues related to this practice in a bilingual autonomous community.

Concerning the limitations of the study and some practical issues, this study would benefit from further research in the following areas:

- Increasing the number of participants: in order to overcome any possible bias on the idiosyncrasies of the studied groups and their results as well as to increase the data, further research should be carried out. However, it should be considered that the usual

differences among groups (of students) may not allow for homogeneous data and results.

- Carrying out research at different points in the academic year: as it has been pointed out, affective factors may change throughout time. Hence, it is possible the data and the results would vary so further testing at different points in time could add to the research done so far.
- Additional research on the differences among the studied groups: although the differences among the three groups have been accounted and researched (RQ5), some issues such as academic results and gender may have played a role in students' perceptions and levels of motivation.

Educational research has to go a step further from academic achievement so to serve to the ultimate purpose: to help improve education and learning. This can only be done if research caters to the classroom reality and considers students, teachers, parents, academic staff and institutions as key elements during the whole research process. Research should be accessible and transparent so to be useful to the classroom practice. In order to do that, it is important to establish a good relationship between academic institutions (scholars) and educational centres (teachers and students) understanding this as a symbiotic relationship whose main aim is to improve education.

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## APPENDICES

### APPENDIX A: Chapter 2

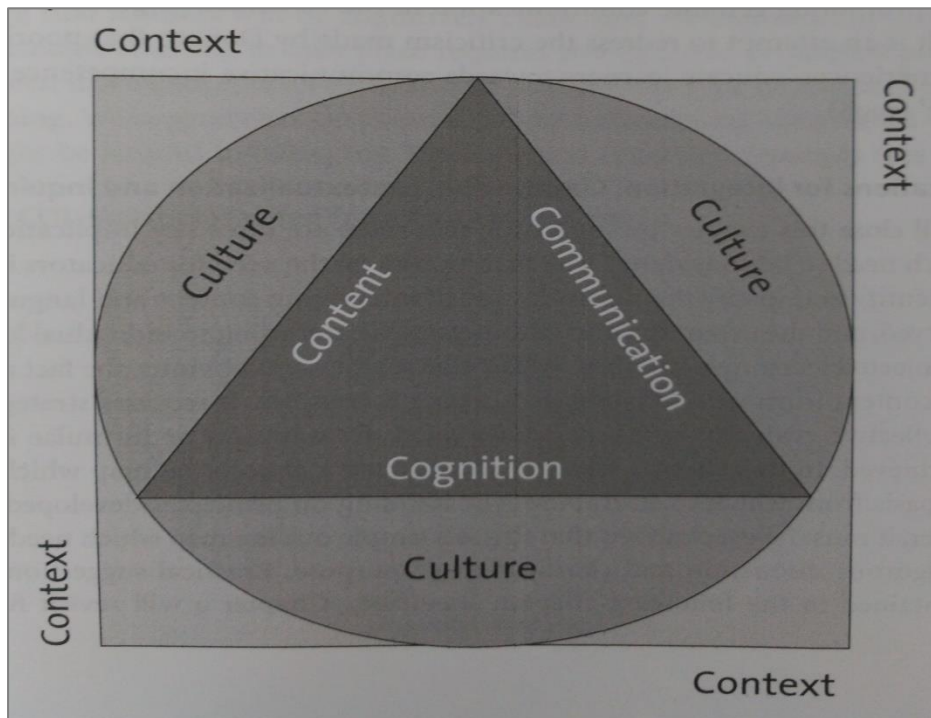


Figure 1: The 4Cs Framework. Coyle, Hood & Marsh 2010, 41.

<b>Structure of the Cognitive Process Dimension of the Revised Taxonomy</b>
<p><b>1.0 Remember</b> – Retrieving relevant knowledge from long-term memory.</p> <p><b>1.1 Recognizing</b></p> <p><b>1.2 Recalling</b></p>
<p><b>2.0 Understand</b> – Determining the meaning of instructional messages, including oral, written, and graphic communication.</p> <p><b>2.1 Interpreting</b></p> <p><b>2.2 Exemplifying</b></p> <p><b>2.3 Classifying</b></p> <p><b>2.4 Summarizing</b></p> <p><b>2.5 Inferring</b></p> <p><b>2.6 Comparing</b></p> <p><b>2.7 Explaining</b></p>
<p><b>3.0 Apply</b> – Carrying out or using a procedure in a given situation.</p> <p><b>3.1 Executing</b></p> <p><b>3.2 Implementing</b></p>
<p><b>4.0 Analyze</b> – Breaking material into its constituent parts and detecting how the parts relate to one another and to an overall structure or purpose.</p> <p><b>4.1 Differentiating</b></p> <p><b>4.2 Organizing</b></p> <p><b>4.3 Attributing</b></p>
<p><b>5.0 Evaluate</b> – Making judgments based on criteria and standards.</p> <p><b>5.1 Checking</b></p> <p><b>5.2 Critiquing</b></p>
<p><b>6.0 Create</b> – Putting elements together to form a novel, coherent whole or make an original product.</p> <p><b>6.1 Generating</b></p> <p><b>6.2 Planning</b></p> <p><b>6.3 Producing</b></p>

Figure 2: Cognitive Process Dimension. Krathwohl 2002, 215.

<b>Structure of the Knowledge Dimension of the Revised Taxonomy</b>
<p><b>A. Factual Knowledge</b> – The basic elements that students must know to be acquainted with a discipline or solve problems in it.</p> <p><b>Aa. Knowledge of terminology</b></p> <p><b>Ab. Knowledge of specific details and elements</b></p> <p><b>B. Conceptual Knowledge</b> – The interrelationships among the basic elements within a larger structure that enable them to function together.</p> <p><b>Ba. Knowledge of classifications and categories</b></p> <p><b>Bb. Knowledge of principles and generalizations</b></p> <p><b>Bc. Knowledge of theories, models, and structures</b></p> <p><b>C. Procedural Knowledge</b> – How to do something; methods of inquiry, and criteria for using skills, algorithms, techniques, and methods.</p> <p><b>Ca. Knowledge of subject-specific skills and algorithms</b></p> <p><b>Cb. Knowledge of subject-specific techniques and methods</b></p> <p><b>Cc. Knowledge of criteria for determining when to use appropriate procedures</b></p> <p><b>D. Metacognitive Knowledge</b> – Knowledge of cognition in general as well as awareness and knowledge of one's own cognition.</p> <p><b>Da. Strategic knowledge</b></p> <p><b>Db. Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge</b></p> <p><b>Dc. Self-knowledge</b></p>

Figure 3: Knowledge Dimension. Krathwohl 2002, 214.

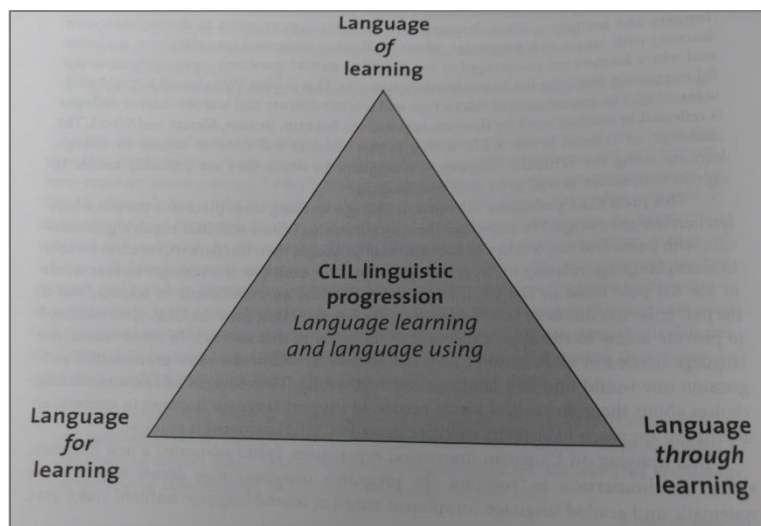


Figure 4: Language Triptych. Coyle, Hood & Marsh 2010, 36.

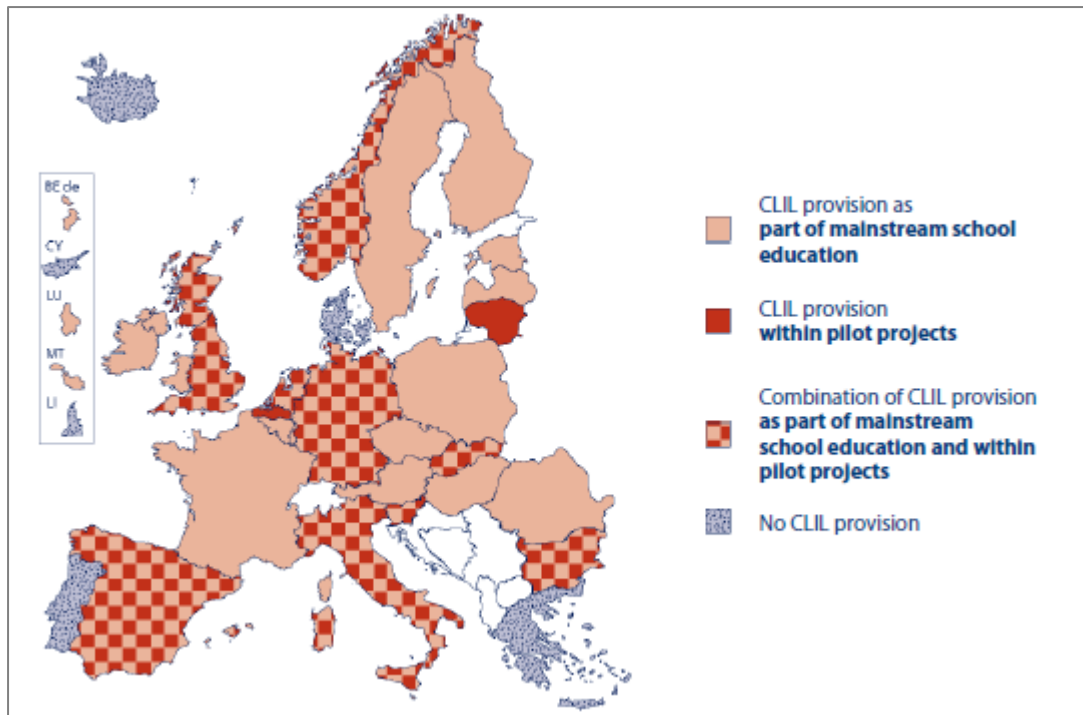


Figure 5: Status of CLIL provision in primary (ISCED 1) and general secondary education (ISCED 2 and 3), 2004/05. Eurydice 2012, 13.

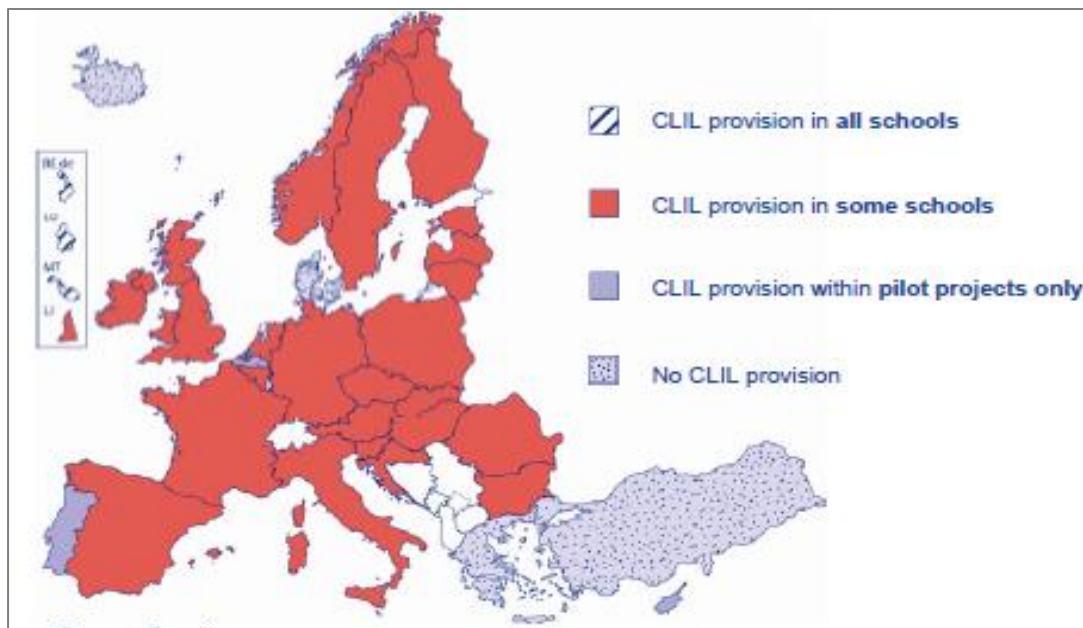


Figure 6: Existence of CLIL provision in primary and/or general secondary education, 2010/11. Eurydice 2012, 39.

	Foreign languages or other official state languages	Régional and/or minority languages
BE fr	Dutch, German and English	⊗
BE de	French	⊗
BE nl	⊗	⊗
CZ	English, French, German, Italian and Spanish	⊗
DK	⊗	⊗
DE	Mainly English and French	Sorbian* and Danish*
EE	Mainly English, German and French	Russian
EL	⊗	⊗
ES	English and French	Basque*, Catalan*, Galician* and Valencian*
FR	English, German, Spanish and Italian	Basque, Breton, Catalan, Corsican, Creole, occitan/ <i>langue d'oc</i> , the Alsace regional languages, Tahitian
IE	English and Irish	⊗
IT	English, German and French	Slovene and other regional languages
CY	⊗	⊗
LV	English, German and French	Polish, Estonian, Lithuanian, Russian, Belorussian and Ukrainian, Hebrew and Romany
LT	⊗	⊗
LU	German, French and English	⊗
HU	German, English, Spanish, French, Italian, Russian and Chinese	German, Croatian, Romanian, Serbian, Slovene and Slovak
MT	English	⊗
NL	English and German	Frisian*
AT	English, French and Italian	Slovene*, Croatian*, Hungarian*, Czech*, Slovak* and Romany
PL	French, Spanish, German, English (lower and upper secondary education) and Italian (upper secondary education)	Belorussian, Lithuanian, German, Slovak, Ukrainian, Kashubian, Lemko (Ruthenian) and Romany
PT	⊗	⊗
SI	⊗	Hungarian* and Italian*
⊗ No CLIL provision for the type(s) of language under this heading * Regional and/or minority languages with official status		

	Foreign languages or other official state languages	Régional and/or minority languages
SK	English, French, German, Spanish and Russian (since 2005)	Hungarian, Ukrainian and Ruthenian
FI	Swedish, French, English, German and Russian	Sami (Lapp)*
SE	English, German, French and Spanish	Yiddish, Sami (Lapp), Torndalen Finnish (Meänkieli), Finnish and Romany
UK-ENG	Most commonly French, German and Spanish	⊗
UK-WLS	⊗	Welsh*
UK-NIR	⊗	Irish
UK-SCT	⊗	Gaelic*
IS	⊗	⊗
LI	⊗	⊗
NO	English	Sami (Lapp)* and Finnish
BG	French, German, Spanish and English	⊗
RO	English, French, German and Italian	German, Romany, Czech, Croatian, Hungarian, Slovak, Serbian, Ukrainian, Turkish and Greek
⊗ No CLIL provision for the type(s) of language under this heading * Regional and/or minority languages with official status		

Figure 7: Target languages used for CLIL provision in primary (ISCED 1) and general secondary education (ISCED 2 and 3), 2004/05. Eurydice 2006, 18.

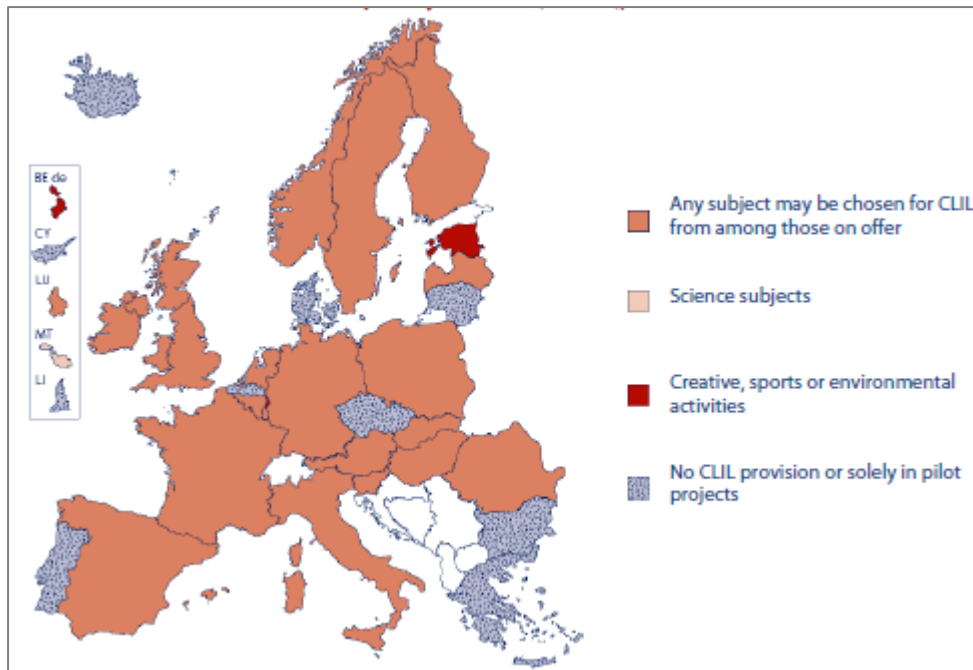


Figure 8: Subjects in the CLIL curriculum in mainstream school provision in primary education (ISCED 1), 2004/05. Eurydice 2006, 25.

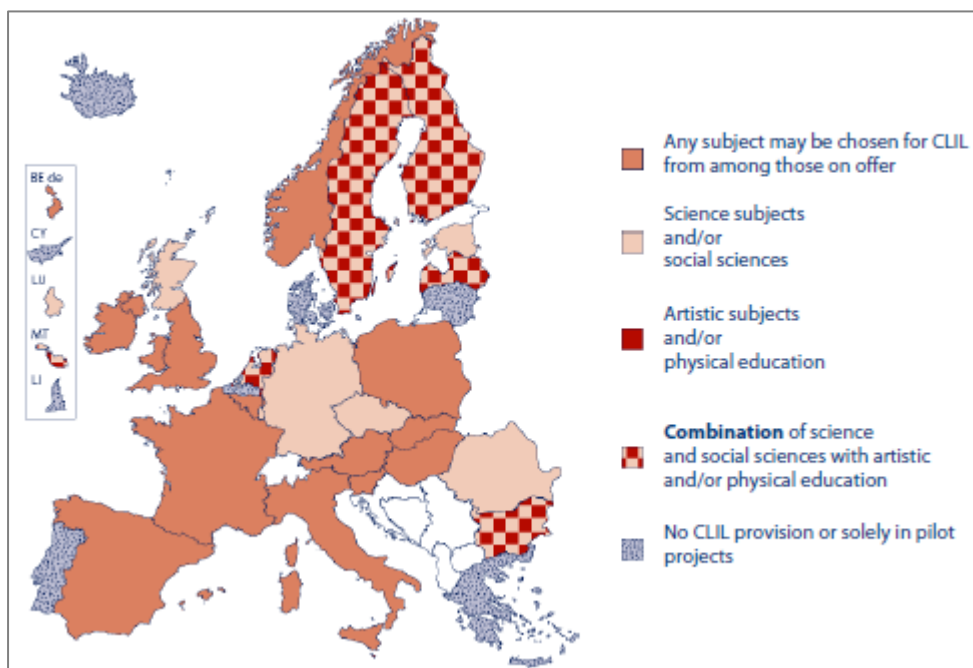


Figure 9: Subjects in the CLIL curriculum in mainstream school provision in general secondary education (ISCED 2 and 3), 2004/05. Eurydice 2006, 26.



	BE fr	BE de	BE nl	CZ	DK	DE	EE	EL	ES	FR	IE	IT	CY	LV	LT	LU	HU
Restrictive legislation			●												●		
A shortage of appropriately qualified teachers	●			●			●		●			●	●	●	●		
Lack of appropriate teaching materials						●											
High costs				●	●				●								

	MT	NL	AT	PL	PT	SI	SK	FI	SE	UK- ENG	UK- SCT	IS	LI	NO	BG	RO
Restrictive legislation		●														
A shortage of appropriately qualified teachers		●		●					●		●				●	
Lack of appropriate teaching materials		●													●	
High costs			●	●												

No CLIL provision
  CLIL offered routinely on a general basis
  Solely pilot projects

Figure 10: Obstacles to the general implementation or further expansion of CLIL in foreign target languages in primary education (ISCED 1) and general secondary education (ISCED 2 and 3), 2004/05. Eurydice 2006, 51.

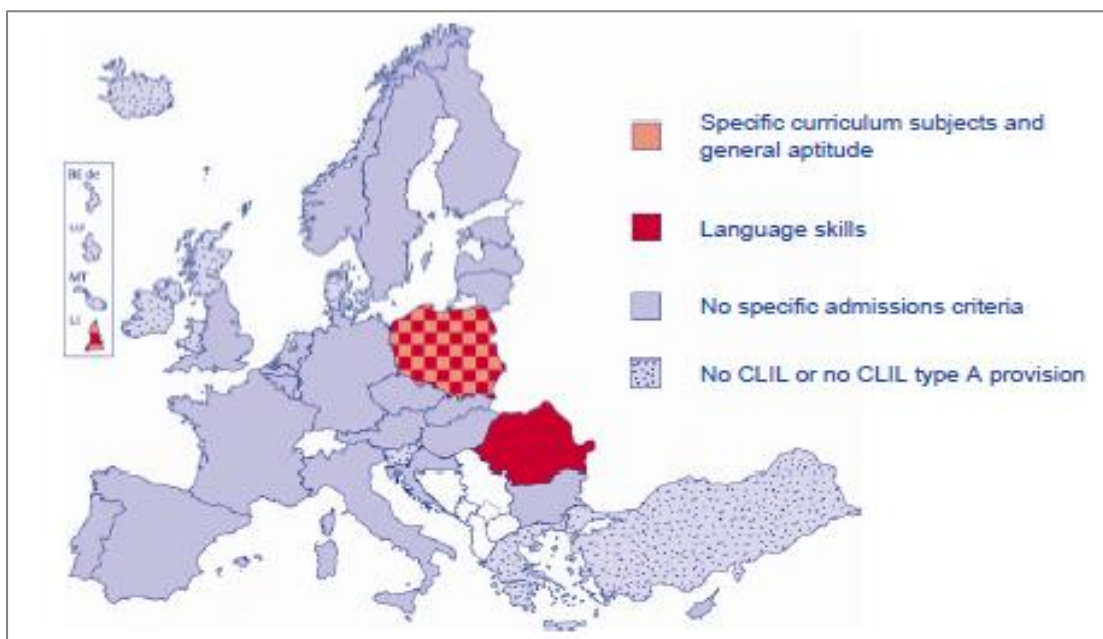


Figure 11: Central recommendations on knowledge- and skills-related admissions criteria for access to CLIL provision in primary education and/or general secondary education, 2010/11. Eurydice 2012, 42.

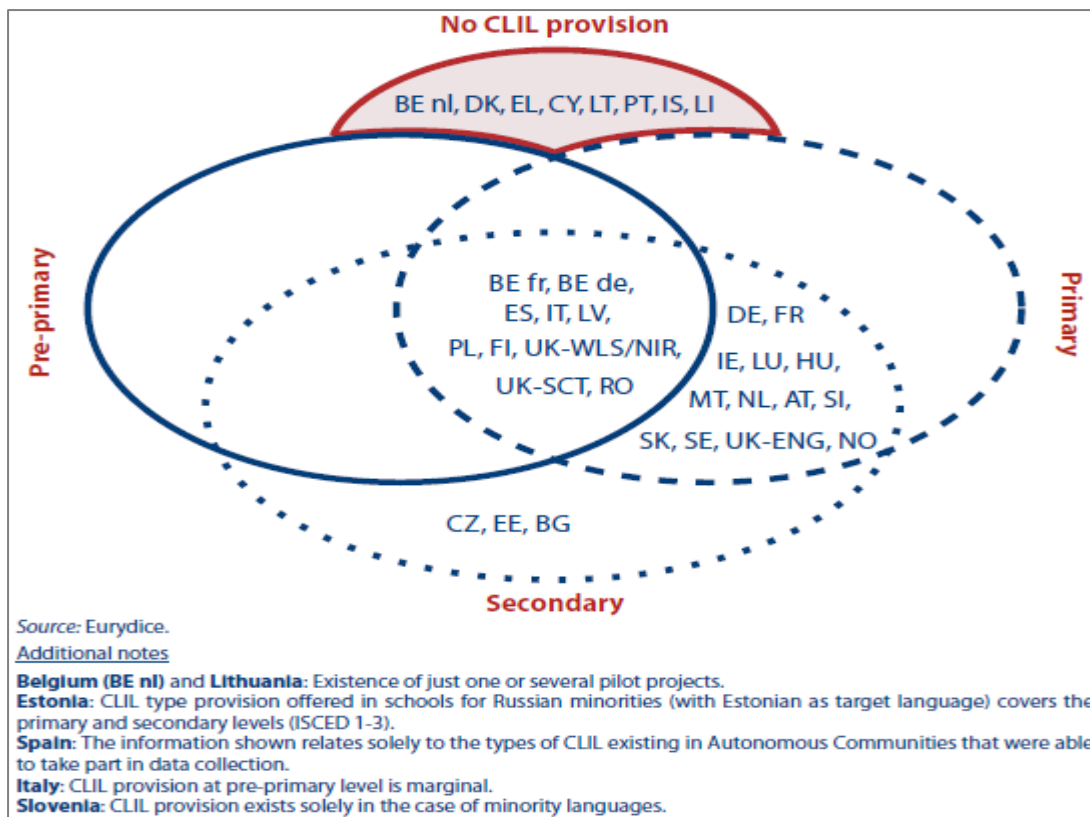


Figure 1: Levels of education at which CLIL is offered in mainstream provision. Eurydice 2006, 20.

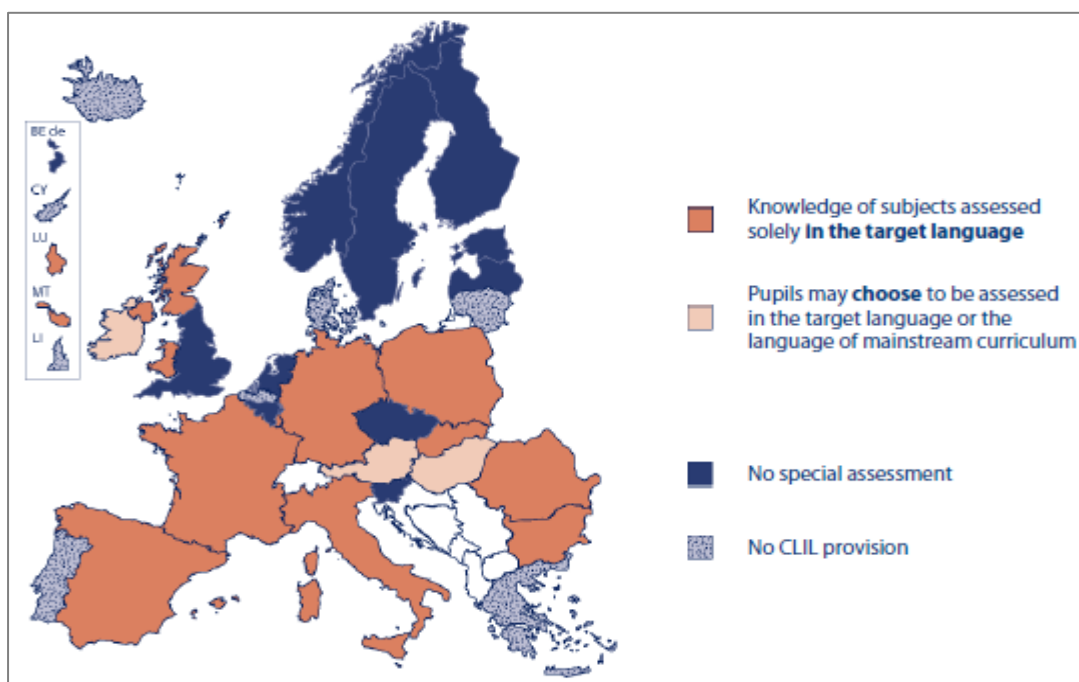


Figure 2: Special assessment of pupils who have taken part in CLIL provision in general secondary education (ISCED 2 and 3), 2004/05. Eurydice 2006, 30.

APPENDIX B: Chapter 3

Autonomous Community	Co-official Language	Population	Percentage
Balearic Islands	Catalan	1.107.220	2,38%
Basque County	Euskera	2.189.534	4,71%
Catalonia	Catalan	7.522.596	16,18%
Galicia	Galician	2.718.525	5,85%
Navarra	Euskera	640.647	1,37%
Valencian Community	Valencian	4.959.968	10,67%
Bilingual communities (in total)		19.138.490	41,18%
Spain		46.468.102	100%

Figure 14: Demographic chart of the bilingual communities in 2016. Data found in <http://www.ine.es/welcome.shtml>



APPENDIX C: Chapter 4

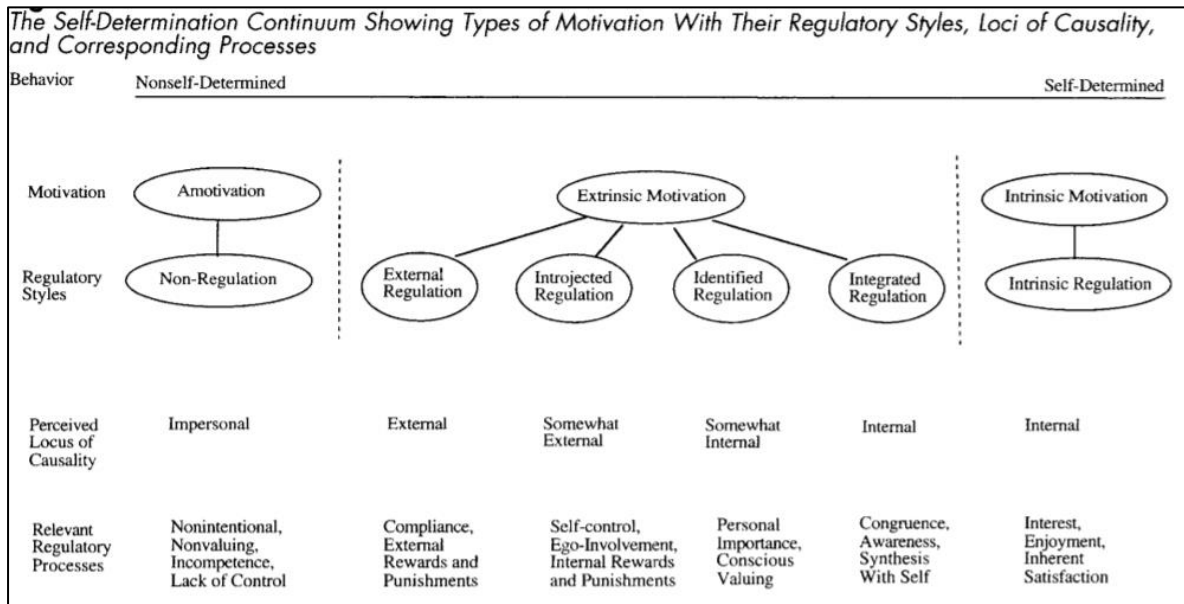


Figure 35: Self-Determination Continuum. Deci & Ryan, 2000, 72.



Figure 16: Cognition. Méndez García, 2014, p. 33.



APPENDIX D: Chapter 5

Figure 47: Physics and Chemistry Classroom.

*Students' Questionnaire*Cuestionario sobre la motivación de estudiantes AICLE

Edad:

Género:       Mujer                       Hombre

1) Actores

- ¿En qué lengua hablas en casa?
- ¿Cuántos años tenías cuando empezaste a aprender inglés?
- ¿Tienes algún certificado de idiomas? ¿Cuál? (ej. Nivel básico EOI, First de Cambridge, etc.)
- Escoge la opción correcta para ti:
  - Fui a un país donde hablaban inglés con mi familia
  - Fui a un país donde hablaban inglés con un grupo de mi edad
  - Estuve viviendo en un país donde hablaban inglés más de un mes
  - Nunca he estado en un país donde hablen inglés
- ¿Sabes/estudias alguna otra lengua extranjera? Si es así, ¿cuál?
- ¿Tuviste alguna asignatura en inglés (aparte de la clase de inglés) en Primaria?
  - SÍ                       NO
 Si la respuesta fue sí, ¿qué asignatura(s)?
   
\_\_\_\_\_
   
\_\_\_\_\_
   
\_\_\_\_\_
- ¿Vas a clases particulares de inglés?
  - SÍ                       NO
- ¿Tus padres saben inglés? Si es así, ¿qué nivel tienen?
  - No hablan inglés
  - Tienen nivel básico
  - Tienen nivel intermedio
  - Tienen nivel avanzado
- ¿Ellos te ayudan a estudiar para esta materia?
- ¿Usas inglés fuera de la clase con tus amigos (redes sociales, televisión, etc.)?
  - SÍ                       NO
- ¿Ves alguna serie de televisión o cine en inglés?
- Me pongo nervioso/-a cuando alguien me habla en inglés
  - Nada                       Un poco                       Algo                       Mucho



- Estoy seguro/-a hablando inglés

Nada       Un poco       Algo       Mucho

## 2) Sentimientos

- En una escala de 1 (muy bajo) a 5 (muy alto), cuál es tu nivel de satisfacción con la sección bilingüe?

1	2	3	4	5
---	---	---	---	---

- Si la sección bilingüe fuese opcional, ¿la habrías escogido?

SÍ       NO

- De 1 a 5, tener Física y Química en inglés lo hace más difícil

1	2	3	4	5
---	---	---	---	---

Sí No

- De 1 a 5, tener Física y Química en inglés me ayuda a mejorar el inglés

1	2	3	4	5
---	---	---	---	---

Sí No

- ¿Tenías alguna preocupación al principio sobre la sección bilingüe? ¿Cuál?

- ¿Y ahora?

- Completa la tabla poniendo x en donde creas que se adapta a tu nivel de inglés:

	Muy bajo	Bajo	Normal	Alto	Muy alto
Leer/Reading					
Escribir/Writing					
Escuchar/Listening					
Hablar/Speaking					

## 3) Actividades (clase)

- En porcentaje, ¿cuánto inglés y cuánto castellano/gallego usas en clase?

Inglés	Castellano
--------	------------

Ejemplo	
Inglés 50%	Castellano 50%

- En porcentaje, ¿cuánto inglés y cuánto castellano/gallego usa el profesor en clase?

Inglés	Castellano
--------	------------

- ¿En qué lengua haces preguntas en clase?

- Durante las actividades en grupo hablo en

Castellano     Gallego     Inglés

- La mayoría de los materiales están en:

Castellano     Gallego     Inglés

- Me gusta el libro de texto

1	2	3	4	5
Sí				No

- Utilizo otros materiales que el profesor me da (handouts, recursos virtuales, etc.)

Verdadero       Falso

- De las siguientes actividades que hiciste en clase, ¿con cuál sientes que has aprendido más inglés?

Preguntas de *Explain, Define, Contrast, Analyze, etc.*

Ejercicios de *Check & Apply*

Problemas de *Solutions-Concentration*

Lectura de *Fractional distillation of petroleum*

Práctica de laboratorio: hacer una disolución

Práctica de laboratorio: separa componentes de una mezcla heterogénea

Práctica de laboratorio: separar agua y aceite

- Para esta actividad, mi nivel de inglés tiene que ser:

Bajo       Intermedio       Alto

- He conseguido manejarme:

Con dificultad       Con cierta dificultad       Sin dificultad

#### 4) Metas

- Saber inglés me ayudará a encontrar un buen trabajo

1	2	3	4	5
Sí				No

- Es necesario saber inglés en el mundo que nos encontramos

1	2	3	4	5
Sí				No

- Aprender Física y Química en inglés me dará ventajas en mi futuro como estudiante y/o trabajador

1	2	3	4	5
Sí				No

- Gracias al uso de inglés en las clases de Física y Química mi inglés hablado es mejor

1	2	3	4	5
Sí				No

- ¿Tiene ventajas la clase bilingüe? Si es que sí, especifica.

- ¿Tiene desventajas la clase bilingüe? Si es que sí, especifica.

APPENDIX E: Chapter 6

*Advantages of the CLIL Section (Questionnaire Answers)*

Advantages of the CLIL Section	
Improving/Practising English	<p>S1A, S10A, S15B, S9C &amp; S15C: “Sí, que se practica el inglés [Yes, you practise English]”.</p> <p>S2A: “Sí, aprendes nuevas palabras, practicas el desarrollo al explicar una cosa, la pronunciación...[Yes, you learn new words, you practise the development when explaining something, the pronunciation...]”.</p> <p>S3A, S6A, S14B, S2C, S7C, S12C, S17C &amp; S18C: “Sí, aprendes más inglés [Yes, you learn more English]”.</p> <p>S4A &amp; S10C: “Sí, porque algunas palabras que no sabías qué significan se aprenden [Yes, because you learn some words that you didn’t know the meaning of]”.</p> <p>S7A &amp; S4C: “Sí, mejorar el inglés [Yes, improving your English]”.</p> <p>S8A: “Sí. Como hay que estudiar en inglés la materia ayuda a manejarse con el idioma [Yes. As you have to study the subject in English this helps you handle the language]”.</p> <p>S9A: “Claro, ayudará a mejorar mi inglés debido a que tengo que buscar más información sobre el tema y es un punto a favor para nuestros conocimientos [Of course, it will help to improve my English due to the fact I have to look up information on the topic and this is a positive point in</p>

	<p>regards to our knowledge”.</p> <p>S11A: “Sí, aprendes mucho: pronunciación [Yes, you learn a lot: pronunciation]”.</p> <p>S12A: “Sí, más desenvoltura con la lengua, quitarse vergüenza al hablarlo [Yes, more ease with the language, not being embarrassed when speaking]”.</p> <p>S13A, S1B &amp; S11B: “Sí, porque coges más vocabulario [Yes, because you learn more vocabulary]”.</p> <p>S15A: “Que aprendo más vocabulario, pronunciación y, en ocasiones, (a mi) me es más fácil de estudiar [I learn more vocabulary, pronunciation and, sometimes, it is easier to study (for me)]”.</p> <p>S3B: “Sí, se aprende a pronunciar y a leer mejor, de escucharlo tanto empiezas a entender mejor [Yes, you learn to pronounce and read better, and after listening so much [English] you start to understand it better]”.</p> <p>S7B: “Sí, porque aprendes inglés más rápido [Yes, because you learn English faster]”.</p> <p>S8B: “Sí. Poder fluirse mejor hablando inglés [Yes. Being more fluent when speaking English]”.</p> <p>S9B: “Sí, porque mejoras el nivel de inglés y eso te ayuda mucho para la asignatura [Yes, because you improve your English level and that helps with the subject]”.</p> <p>S12B: “Sí, porque de mayor necesitas el inglés [Yes, because you will need [to know] English as a grown up]”.</p>
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	<p>S13B: “Sí, aprendes inglés y los exámenes no son tanto de escribir [Yes, you learn English and exams are not so much about writing]”.</p> <p>S16B: “Sí, porque practicamos el idioma y a mí me es más fácil estudiar en inglés [Yes, because we practise the language and it is easier to study in English for me]”.</p> <p>S17B: “Sí, ayuda a expresarse [Yes, it helps to express yourself]”.</p> <p>S6C: “Sí, aprendes vocabulario fuera de lo cotidiano [Yes, you learn vocabulary out of the ordinary]”.</p>
Learning Content	<p>S2B &amp; S6B: “Sí, es más sencillo [Yes, it is simpler]”.</p> <p>S1C: “Sí, que aprendo [Yes, I learn]”.</p> <p>S5C: “Sí, que aprendes más cosas [Yes, you learn more things]”.</p>
Assessment	<p>S13C: “Los exámenes son más fáciles, hay ejercicios de tipo test y completar entre otros [Exams are easier, there are multiple choice and fill in the blanks items]”.</p> <p>[See also S13B’s answer]</p>

*Disadvantages of the CLIL Section (Questionnaire Answers)*

Disadvantages of the English Section	
Language-related Concerns	<p>S4A: “Que puede hacer más difícil el estudio [It may make studying to be more difficult]”.</p> <p>S5A: “Sí. Porque no se me da bien el Inglés [Yes. Because I’m not very good with English]”.</p> <p>S7A, S3B, S16B &amp; S2C: “Sí, gente que puede no entender [Yes, people who may not understand (English)]”.</p> <p>S8A: “Sí. Hay personas que les cuesta estudiar en inglés o entender lo que hay que estudiar tan bien como en castellano [Yes. There are people who find studying in English harder than in Spanish]”.</p> <p>S13A: “Sí, porque me cuestan más algunas palabras [Yes, because I find some words difficult]”.</p> <p>S15A: “Que si habla muy rápido el profesor y no te enteras de algo ese ‘algo’ que no entiendes te lo va a explicar en inglés... [If the teacher speaks very fast and you don’t understand something, he’s going to explain that in English...]”.</p> <p>S1B: “Sí, me gusta mucho Física y Química y dándola en inglés aprendemos menos de la asignatura [Yes, I like Physics and Chemistry a lot and, due to the fact that we learn it in English, we learn less content]”.</p> <p>S7B: “Sí, porque no sabrás las palabras que has dado [Yes</p>

	<p>because you won't know the words you have been taught]".</p> <p>S8B: "Sí, que en casa no puedo practicar mucho el inglés [Yes, I can't practise much English at home]".</p> <p>S10B: "Sí, porque no aprendemos ni inglés ni física así [Yes, because we don't learn English or Physics like this]".</p> <p>S11B: "Nos quedarían mejor las cosas en castellano [We would remember things better in Spanish]".</p> <p>S13B &amp; S15B: "Sí, hay muchas palabras que no se conocen y expresiones en inglés que no he visto [Yes, there are many words and expressions in English that I haven't studied]".</p>
Level of Difficulty	<p>S2A: "Sí, a veces me rompe la cabeza [Yes, it gives me a headache sometimes]".</p> <p>S3A: "Sí, cuesta bastante [Yes, it is quite difficult]".</p> <p>S2B: "Sí, no aprendemos tanto Física y Química [Yes, we don't learn that much of Physics and Chemistry]".</p> <p>S6B: "Sí, que si no sabes mucho, suspendes [Yes, if you don't know a lot, you fail]".</p> <p>S9B: "Un poco, porque es más complicado. Pero una vez que te acostumbras no hay problema [A bit because it is more complicated. But once you get used to it, there's no problem]".</p> <p>S4C: "Sí, porque es más complicado [Yes, because it's more complicated]".</p> <p>S5C &amp; S17C: "Sí, es más difícil de aprender [Yes, it's more difficult to learn]".</p>

	<p>S6C &amp; S10C: “Sí, pero solo que es un poco más costoso de estudiar [Yes, but only because it is a bit more difficult to study]”.</p> <p>S8C, S16C &amp; S18C: “Sí, que no me entero de nada [Yes, the fact that I understand nothing]”.</p> <p>S9C: “Sí, que puede ser más difícil de entender y estudiar [Yes, it could be more difficult to learn and study]”.</p> <p>S13C: “Es más difícil de aprender, especialmente problemas o cosas así [It’s more difficult to learn, especially problems or things like that]”.</p> <p>S19C: “A veces. Porque no entiendo cosas [Sometimes. Because I don’t understand stuff]”.</p>
Other Issues	<p>S6A: “La última hora de clase [Last period]”.</p> <p>S11A: “La clase es un poco apagada [The lesson is a bit bleak]”.</p>



## APPENDIX F: Classroom Materials

## Textbook Unit

# 19-1

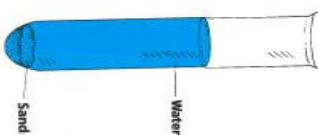
## What is a solution?

**Objective** ▶ Describe the characteristics of a solution.

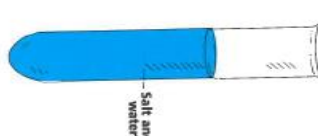
**Technique**

- ▶ **dissolve:** go into solution
- ▶ **solution:** mixture in which one substance is evenly mixed with another substance

**Salt and Water** What would happen if you added some sand to a test tube of water? The sand would settle to the bottom of the test tube. Suppose you then added some salt to another test tube of water. The salt disappears in the water. The salt is still in the water, but you cannot see it. The salt has dissolved (di-ZAHL-ved) in the water. When a substance **dissolves**, it goes into solution. The sand did not dissolve in the water.



**Sand does not dissolve in water.**



**Salt dissolves in water.**

**Solutions** A mixture of salt and water is called a solution. A **solution** is a mixture in which one substance is evenly mixed with another substance. In a saltwater solution, particles of salt are evenly mixed with molecules of water.

**Define:** What is a solution?

**Types of Solutions** A liquid solution is formed when a solid dissolves in a liquid. Salt water is a liquid solution. A liquid solution may also be formed when a gas dissolves in a liquid. Club soda is a solution of the gas carbon dioxide dissolved in water. One liquid may dissolve in another liquid to form a liquid solution. Water and alcohol form this type of solution.

Liquid solutions are formed when solids, liquids, or gases dissolve in liquids. Solutions can also be formed when different substances dissolve in solids and gases. Table 1 shows some examples of different kinds of solutions.

**Analyze:** Why is air called a solution?

Table 1 Types of Solutions		
SUBSTANCE	DISSOLVED IN	EXAMPLES
Liquid	Liquid	alcohol in water
Gas	Gas	water vapor in air
	Solid	either in rubber club soda (CO <sub>2</sub> in water)
	Gas	air (N <sub>2</sub> , O <sub>2</sub> , and other gases)
	Solid	hydrogen in palladium
Solid	Liquid	salt in water
	Gas	iodine vapor in air
	Solid	brass (copper and zinc)

**Explain:** Why does salt seem to disappear in water?

**LESSON SUMMARY**

- ▶ When a substance dissolves, it goes into solution.
- ▶ A solution is a mixture in which one substance is evenly mixed with another substance.
- ▶ Salt water is an example of a solution made from a liquid and a solid.
- ▶ Solutions can form when a substance dissolves in a solid or in a gas.

**CHECK** Complete the following.

1. Solutions are formed when substances \_\_\_\_\_ in other substances.
2. Salt water is a solution formed when a \_\_\_\_\_ dissolves in a liquid.
3. A mixture in which one substance is evenly mixed with another substance is called a \_\_\_\_\_.
4. Club soda is an example of a solution formed when a \_\_\_\_\_ dissolves in a liquid.
5. Salt water is a solution formed when a solid dissolves in a \_\_\_\_\_.

**APPLY** Complete the following.

6. **Classify:** Which of the following substances are solutions?

a. sugar	c. sea water
b. mud	e. salt and pepper
c. club soda	f. sand
d. flour	g. sand
	h. air

7. For each of the substances you classified as solutions in question 6, identify the type of solution formed.

**Skill Builder**


**Organizing Information** When you organize information, you put the information in some kind of order. A table is one way to organize information. Alloys, such as brass, are solid solutions. Make a table with the following headings: "Alloy," "Metals in Solution," and "Uses." Identify three different alloys, the metals they contain, and their common uses. Organize the information in your table.

**CAREER IN PHYSICAL SCIENCE**

**ANALYTICAL CHEMIST**

Do you enjoy studying science and mathematics? Can you make careful, precise measurements? Are you determined to find the answer to a problem? If so, you may enjoy a career as an analytical chemist. Analytical chemists analyze the chemical composition of substances. They perform experiments to identify special characteristics of the substances. They test substances to find out what will happen when different substances are combined.

Most analytical chemists work in laboratories. Often, they work as part of a team investigating a certain problem. Their work is very precise and requires careful attention to details. To become an analytical chemist, you need a college degree in chemistry. Usually, analytical chemists have a strong background in mathematics. For some positions, a graduate degree in a special field of interest is necessary.



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# 19-2 What are the parts of a solution?

**Objective** ▶ Identify the parts of a solution.

**TechTerms**

- ▶ **insoluble** (in-SAHL-yoo-buhl): not able to dissolve
- ▶ **soluble** (SAHL-yoo-buhl): able to dissolve
- ▶ **solute** (SAHL-yoo): substance that is dissolved in a solvent
- ▶ **solvent**: substance in which a solute dissolves

**Parts of a Solution** All solutions are made when one substance dissolves in another substance. A solution of salt and water forms when salt dissolves in water. The part of a solution that dissolves is called the **solute** (SAHL-yoo). Salt is the solute in a solution of salt and water. The part of the solution in which a solute dissolves is called the **solvent**. Water is the solvent in a saltwater solution.

**Contrast:** What is the difference between a solute and a solvent?

**Soluble Substances** Water is the solvent in many types of solutions. Club soda is a solution in which water is the solvent and carbon dioxide is



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the solute. Because carbon dioxide dissolves in water, it is said to be **soluble** (SAHL-yoo-buhl) in water. A substance is soluble in water if it dissolves in water.

**Predict:** What will happen when carbon dioxide gas is mixed with water?

**Insoluble Substances** Many substances do not dissolve in water. A concrete sidewalk does not dissolve in rainwater. Sand does not dissolve in a glass of water. A plastic container does not dissolve when you add water to it. These substances are **insoluble** (in-SAHL-yoo-buhl) in water. A substance is called insoluble if it does not dissolve in another substance.



A substance may dissolve in one substance but not in another substance. Sugar dissolves in water. It is soluble in water. Sugar does not dissolve in oil. It is insoluble in oil. The type of solvent determines whether a solute is soluble or insoluble.

**Analyze:** How can a substance be both soluble and insoluble?

**LESSON SUMMARY**

- ▶ The substance that dissolves in a solution is called the **solute**.
- ▶ The solvent is the substance in which a solute dissolves.
- ▶ A substance that dissolves in another substance is soluble in that substance.
- ▶ A substance is insoluble if it does not dissolve in a particular substance.
- ▶ A substance may be soluble in one solvent but insoluble in a different solvent.

**CHECK** Write true if the statement is true. If the statement is false, change the underlined term to make the statement true.

1. Salt is the solute in a saltwater solution.
2. Cement is soluble in water.
3. The substance in which a solute dissolves is called a solvent.

4. Sugar is insoluble in water.
5. In a solution of sugar and water, water is the solute.

**APPLY** Complete the following.

6. **Classify:** Instant coffee is a solution formed from coffee powder and hot water. Identify the solute and the solvent in this solution.
7. Is wood soluble in water? How do you know?

**Ideas in Action**

**IDEA:** Many soft drinks are types of solutions. **ACTION:** List five different soft drinks you enjoy drinking. Use library references to find out which soft drinks are solutions. Identify the solute and solvent in each of the solutions you named.

**SCIENCE CONNECTION**

**CHEMICAL WEATHERING**

Weathering is the breaking up of rocks and minerals by natural forces, such as wind and water. In mechanical weathering, rocks are broken down due to the action of wind or water. In chemical weathering, substances in water cause substances in the rock to dissolve. This action weakens the structure of the rock. The rock is then more likely to be broken apart by mechanical weathering.

A common type of chemical weathering takes place when carbon dioxide from the air dissolves in rainwater. A solution called carbonic acid forms in the rainwater. When the rainwater seeps into rocks, the carbonic acid dissolves limestone in the rocks. The dissolved limestone is carried away by the rainwater. As a result, cracks are left in the rocks. The next time the rocks are struck by moving wind or water, they will easily crumble away. Sometimes, the dissolving of soluble minerals in rocks can lead to the formation of caves.



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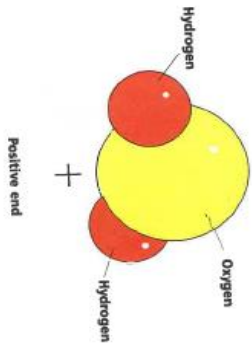
# 19-3 Why is water a good solvent?

**Objective** Explain why water is sometimes called the universal solvent.

**TechTerm**

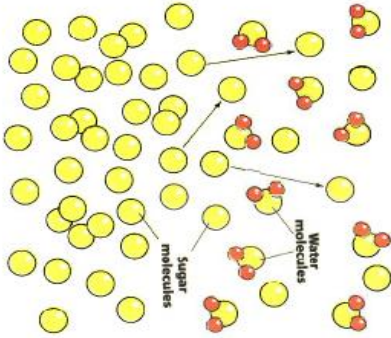
**polar molecule:** molecule in which one end has a positive charge and the other end has a negative charge

**Water Molecules** Water is a type of polar molecule. A **polar molecule** is a molecule in which one end has a positive charge and the other end has a negative charge. A molecule of water is made up of two atoms of hydrogen joined to one atom of oxygen. The hydrogen end of a water molecule has a positive charge. The oxygen end of a water molecule has a negative charge.



**Explain:** Why is a water molecule called a polar molecule?

**The Universal Solvent** Water is sometimes called the universal (yoo-nih-VUR-sul) solvent. This is because many types of substances dissolve in water. The electrical charges in polar water molecules help dissolve different kinds of substances. A solution forms when a solute mixes evenly with a solvent. The charged ends of a water mole-



cule help spread a solute throughout the water. Suppose you place a sugar cube in a glass of water. The ends of the water molecules attract the molecules in the sugar cube. Each sugar molecule is pulled to a water molecule. As the sugar dissolves, sugar molecules are mixed throughout the water.

**Describe:** What happens to the sugar molecules when sugar is placed in water?

**Force of Attraction** Solutions form when the force of attraction between the solute and solvent is greater than the force of attraction between the particles in the solute. A sugar cube gets its shape from the force of attraction between its molecules. The sugar molecules will break away from the sugar cube only if they are pulled by a greater force of attraction. This is also true of other types of solutes.

**Predict:** What will happen if the force of attraction between solute particles is greater than the force of attraction between solute and solvent?

**LESSON SUMMARY**

- ▶ A molecule in which one end has a positive charge and the other end has a negative charge is called a polar molecule.
- ▶ Water is called the universal solvent because it can dissolve many different substances.
- ▶ Solutions form when the force of attraction between the solute and solvent particles is greater than the force of attraction between the solute particles.

**CHECK** Complete the following.

1. Water is a \_\_\_\_\_ molecule.
2. Water is sometimes called the \_\_\_\_\_ solvent.
3. The hydrogen end of a water molecule has a \_\_\_\_\_ electrical charge.
4. The force of attraction between water molecules and sugar molecules is \_\_\_\_\_ than the force of attraction between the sugar molecules.

5. Solutions form when the force of attraction between the solute and solvent is greater than the force of attraction between particles of the \_\_\_\_\_.

**APPLY** Complete the following.

6. **Inter:** A substance put in a glass of water does not dissolve. What does this tell you about the force of attraction between particles of the substance?
7. **Hypothesize:** Will a teaspoon of water dissolve in a glass of water? Explain.

**Skill Builder** .....

**Building Vocabulary** A molecule, such as water, with opposite electrical charges is called a polar molecule. Use a dictionary to identify the general meaning of the word "polar." How does this definition relate to the North Pole and South Pole of the earth? How does it apply to the poles of a magnet?

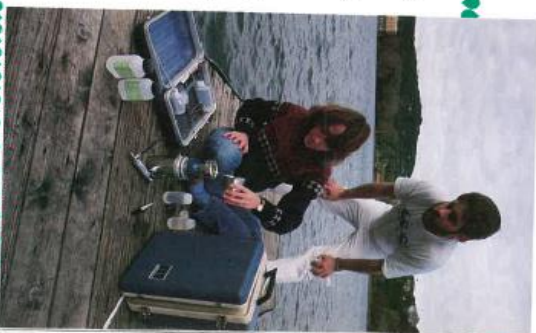
## CAREER IN PHYSICAL SCIENCE

**WATER PURIFICATION CHEMIST**

Water is a very important resource. Cities and towns need large supplies of fresh drinking water. Often, these supplies of water come from rivers, lakes, or reservoirs. The water from these sources must be tested to be sure it is safe to drink.

Water purification chemists analyze water in purification plants. They perform various tests on the water to find out its chemical composition. They analyze the results of their tests. Based on their analysis, they then identify which chemicals should be added to the water to make it suitable for drinking. Most of this work is done in laboratories at the purification plant.

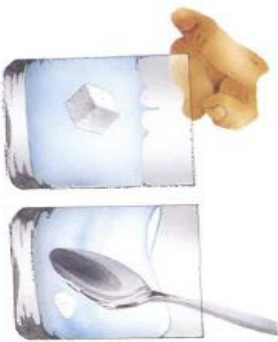
In order to work as a water purification chemist, you need a college degree in chemistry. You also need a good background in mathematics. Some positions require a graduate degree in a specialized field.



# 19-4 How can you change the rate of dissolving?

**Objective** ▶ Describe three ways to speed up the rate of dissolving.

**Stirring** Solutions form when a solute dissolves in a solvent. The rate at which a solid solute dissolves can be changed. Certain factors can speed up the rate at which a solute dissolves. Stirring a solution will make the solute dissolve faster. If you put a cube of sugar into a glass of water, it will eventually dissolve. However, stirring the water will cause the sugar to dissolve faster. Stirring the water causes the sugar molecules to leave the cube more rapidly. The sugar dissolves faster.



**Infer:** Why does stirring make a sugar cube dissolve faster in water?

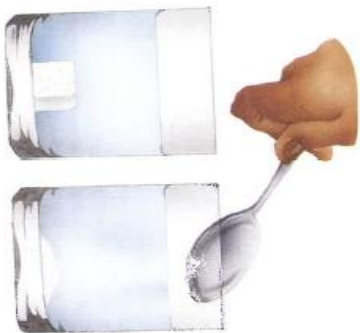
**Temperature** The temperature of a liquid solvent affects the rate at which a solid solute dissolves. A cube of sugar dissolves faster in hot water than in an equal amount of cool water. Heat causes the molecules of sugar to leave the cube more rapidly. As the temperature of a liquid solvent increases, the rate at which a solid solute dissolves also increases.

**Relate:** What is the relationship between the temperature of a liquid solvent and the rate at which a solid solute dissolves in it?

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**Particle Size** The size of the particles of a solid solute also affects the rate at which it dissolves. The smaller the size of the solute particles, the faster the solute dissolves. A crushed sugar cube dissolves faster in water than a solid sugar cube placed in a equal amount of water at the same temperature. As the size of solute particles decreases, the rate at which the solute dissolves increases.



**Predict:** Which would dissolve faster in the same amount of water at the same temperature, a sugar cube or powdered sugar?

## LESSON SUMMARY

- ▶ Stirring a solvent increases the rate at which a solute dissolves.
- ▶ As the temperature of a solvent increases, the rate at which a solute dissolves also increases.
- ▶ The smaller the size of the particles in a solute, the faster the solute dissolves in a solvent.

**CHECK** Complete the following.

1. Stirring a solvent \_\_\_\_\_ the rate at which a solute dissolves in it.
2. Sugar dissolves more slowly in \_\_\_\_\_ water than in hot water.
3. The smaller the size of solute particles, the \_\_\_\_\_ the rate of dissolving.
4. As the \_\_\_\_\_ of a solvent increases, the rate at which a solute dissolves also increases.
5. Powdered sugar dissolves \_\_\_\_\_ than a sugar cube placed in equal amounts of water at the same temperature.

**APPLY** Complete the following.

6. **Infer:** Why are most types of instant coffee made in powdered form?

7. Why is it easier to make tea with boiling water than with cold water?
8. Which of the following will make a solute dissolve faster in a solvent? Explain your answers.
  - a. Place the solvent in a freezer.
  - b. Grind the solute into small pieces.
  - c. Place the solvent in a blender.
  - d. Let the solvent stand without stirring.
  - e. Heat the solvent.

## Infosearch

Read the passage. Ask two questions that you cannot answer from the information in the passage.

**Dissolving Gases** Some gases, such as oxygen and carbon dioxide, are soluble in water. Oceans, lakes, and rivers all contain dissolved oxygen. Club soda contains dissolved carbon dioxide. The temperature of a liquid solvent has the opposite effect on gaseous solutes than on solid solutes. As the temperature of the solvent decreases, the dissolving rate of a gaseous solute increases.

**SEARCH:** Use library references to find answers to your questions.

## ACTIVITY

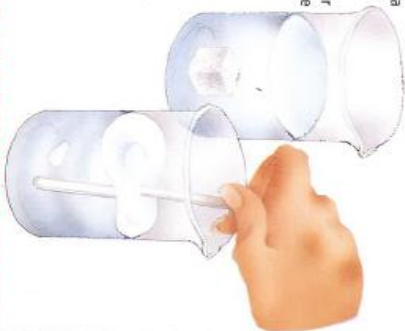
### CHANGING THE RATE OF DISSOLVING

You will need four beakers, a graduated cylinder, water, a spoon, and sugar cubes.

1. Put 100 mL of water in each beaker.
2. Place one sugar cube each in the first two beakers. Stir the water in the first beaker with the spoon. Leave the water in the second beaker untouched. Compare the results.
3. Use the spoon to crush a sugar cube. Carefully drop the crushed sugar into the third beaker. Place one sugar cube in the fourth beaker. Compare the results.

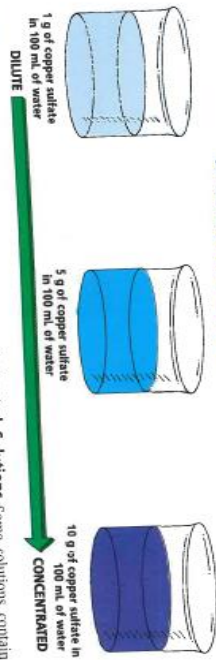
### Questions

1. What effect did stirring have on the dissolving rate of the sugar cube?
2. What effect did crushing the sugar cube have on the rate of dissolving?
3. **Hypothesize:** What is the fastest way to dissolve a sugar cube in 100 mL of water?



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# 19-6 What is the concentration of a solution?



**Objective** ▶ Differentiate between saturated and unsaturated solutions.

**TechTerms**

- ▶ **concentrated solution:** strong solution
- ▶ **dilute solution:** weak solution
- ▶ **saturated solution:** solution containing all the solute it can hold at a given temperature
- ▶ **unsaturated solution:** solution containing less solute than it can hold at a given temperature

**Dilute and Concentrated** A weak solution has a small amount of dissolved solute. Weak solutions are called **dilute solutions**. A strong solution has a large amount of dissolved solute. Strong solutions are called **concentrated solutions**.

**Compare:** What is the difference between a dilute solution and a concentrated solution?

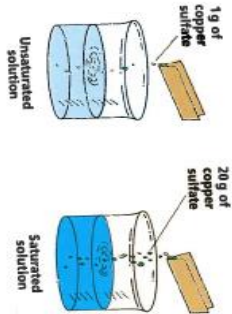
**Unsaturated Solutions** There is a limit to the amount of solute a solvent can hold. Some solutions have less solute than they can hold. For example, if you put 1 g of copper sulfate in 100 ml of water, the copper sulfate will dissolve. However, the water could hold an additional amount of copper sulfate. This solution is called an **unsaturated solution**. An **unsaturated solution** contains less solute than it can hold at a given temperature.

**Define:** What is an unsaturated solution?

**Saturated Solutions** Some solutions contain all the solute they can hold at a given temperature. These solutions are called **saturated solutions**.

Suppose you put 20 g of copper sulfate in 100 ml of water. Some of the copper sulfate will dissolve in the water. However, some of the copper sulfate will remain on the bottom of the container. It does not dissolve because the water has taken in as much solute as it can hold.

**Hypothesize:** Why would some solute remain undissolved in a solution?



**Solvent Temperature** Heating a saturated solution often causes it to become unsaturated. This is because the temperature of a solvent determines the amount of solute it can hold. As the temperature of a solvent increases, so does the amount of solute it can hold. Heating a saturated solution increases the amount of solute it can dissolve.

**Predict:** What will happen if you heat a saturated solution?

**LESSON SUMMARY**

- ▶ A weak solution is called a dilute solution, and a strong solution is called a concentrated solution.
- ▶ An unsaturated solution contains less solute than it can hold at a given temperature.
- ▶ A saturated solution contains all the solute it can hold at a given temperature.
- ▶ Heating a saturated solution usually causes it to become unsaturated.

**CHECK** Complete the following.

1. A \_\_\_\_\_ solution contains a small amount of dissolved solute.
2. An unsaturated solution contains less \_\_\_\_\_ than it can hold at a given temperature.
3. A \_\_\_\_\_ solution contains a large amount of dissolved solute.
4. A solution that contains all the solute it can hold at a given temperature is called a \_\_\_\_\_ solution.

5. When saturated solutions are \_\_\_\_\_, they usually become unsaturated.

**APPLY** Complete the following.

6. **Hypothesize:** Is a can of frozen juice a concentrated solution or a dilute solution? Explain.
7. **Predict:** Suppose the directions on the can of frozen juice state that it should be mixed with three cans of water. What type of solution would you make if you added five cans of water? Explain.

**Ideas in Action**

**IDEA:** Many products used in cooking are concentrated solutions that become dilute when water or some other solvent is added.

**ACTION:** Make a list of five products found in your home that are concentrated solutions. Describe what you must do to dilute them.

**ACTIVITY**

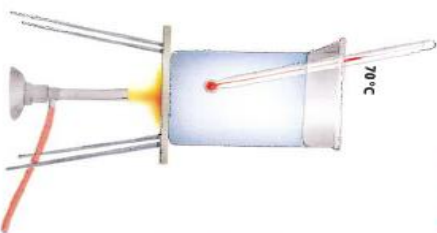
**MAKING A SUPERSATURATED SOLUTION**

You will need 6 g of ammonium chloride, a beaker, water, a heat source, a stirring rod, and a thermometer.

1. Put 100 mL of water in the beaker. Add 4 g of ammonium chloride to the beaker and stir.
2. Heat the solution in the beaker to a temperature of 70 °C. Carefully remove the beaker from the heat.
3. Add the remaining 2 g of ammonium chloride to the beaker. Stir the solution. Let it cool to room temperature. Observe the results.

**Questions**

1. What happened to the solution when it was heated?
2. What happened to the solute when the water was cooled to room temperature?
3. **Analyze:** Supersaturated solutions contain more solute than they can usually hold at a given temperature. What caused the ammonium chloride and water solution to become supersaturated?



# 19-6 How do solutes affect freezing point?

**Objective** Describe how a solute affects the freezing point of a solution.

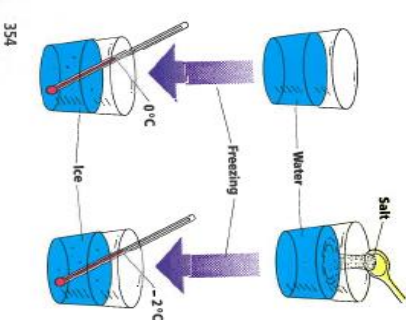
**TechTerms**

- ▶ **freezing point:** temperature at which a liquid changes to a solid
- ▶ **freezing point depression:** lowering the freezing point of a liquid solvent by adding solute

**Freezing Point of Water** The temperature at which a liquid changes to a solid is called its **freezing point**. The freezing point of pure water is 0 °C. When pure liquid water reaches this temperature, it changes to solid ice.

Salt water does not freeze at 0 °C as pure water does. The particles of salt dissolved in the water interfere with the change from a liquid to a solid. Because salt water contains dissolved salt, its freezing point is lower than that of pure water. Salt water freezes at a lower temperature than pure water.

**Describe:** What happens to liquid water at its freezing point?



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**Freezing Point Depression**

The amount of solute dissolved in a solvent affects the freezing point of the solvent. This special property of solutions is called **freezing point depression**. Adding solute to a liquid solvent lowers the freezing point of the solvent. The greater the amount of dissolved solute, the lower the freezing point of the solvent.

**Predict:** What will happen to the freezing point of water as you add more solute to the water?

**Rock Salt** Have you ever thrown rock salt on an icy sidewalk? Salt is sprinkled on icy sidewalks because the salt lowers the freezing point of water. When the ice starts to melt, the salt dissolves in the water and forms salt water. The salt water has a lower freezing point than pure water. The temperature must get lower than 0 °C before the salt water freezes. As a result, ice does not form as fast.



**Explain:** Why is rock salt thrown on an icy sidewalk?

**LESSON SUMMARY**

- ▶ Freezing point is the temperature at which a liquid changes to a solid.
- ▶ The freezing point of salt water is lower than that of pure water.
- ▶ Lowering the freezing point of a liquid solvent by adding solute is called freezing point depression.
- ▶ Rock salt lowers the freezing point of the melted ice on an icy sidewalk.

**CHECK** Write true if the statement is true. If the statement is false, change the underlined term to make the statement true.

1. The freezing point of pure water is 0 °C.
2. The greater the amount of dissolved solute in a solvent, the higher the freezing point of the solvent.
3. The freezing point of salt water is lower than the freezing point of pure water.
4. Lowering the freezing point of a liquid solvent by adding solute is called freezing point depression.
5. Putting salt on icy roads raises the freezing point of the melted ice.

**InfoSearch**  
Read the passage. Ask two questions that you cannot answer from the information in the passage.  
**Hard Water** Tap water from your kitchen faucet is not pure water. It does not freeze at exactly 0 °C. It freezes at a lower temperature because it contains dissolved solutes. Some tap water contains dissolved minerals including calcium bicarbonate, magnesium sulfate, calcium chloride, and iron sulfate. Water containing these solutes is called hard water.

**SEARCH:** Use library references to find answers to your questions.

**APPLY** Complete the following.

6. **Compare:** Beaker A contains 2 g of sugar dissolved in 100 mL of water. Beaker B contains 10 g of sugar dissolved in 100 mL of water. Which beaker contains the solution with the lower freezing point? Explain your answer.
7. **Analyze:** Beaker 1 and Beaker 2 each contain 5 g of dissolved copper sulfate. Beaker 1 contains 100 mL of water while Beaker 2 contains 250 mL of water. Which beaker contains the solution with the lower freezing point? Explain your answer.

**SCIENCE CONNECTION**

**FISHES WITH ANTI-FREEZE**

Fishes that live in the Arctic Ocean must survive freezing and near-freezing water temperatures. Scientists wondered why these fishes did not freeze in such an environment. The scientists studied fishes in the Arctic region of northern Labrador.

Scientists discovered that the blood of the Arctic fishes contained a high concentration of a certain protein. The amount of protein in the fishes' blood, the greater the freezing point of the blood.

In order for the fishes' blood to freeze, the water temperature must drop below 0 °C. As a result of this freezing point depression, the fishes can survive in the cold Arctic environment.



# 19-7 How do solutes affect boiling point?

**Objective** Describe how a solute affects the boiling point of a solution.

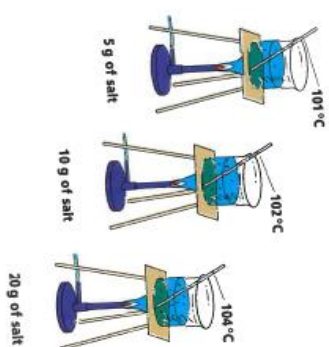
### TechTerms

- ▶ **boiling point:** temperature at which a liquid changes to a gas
- ▶ **boiling point elevation:** raising the boiling point of a liquid solvent by adding solute

**Boiling Point of Water** When water is heated, its temperature rises. When the temperature of the water reaches 100 °C, the liquid water changes to steam. The temperature at which a liquid changes to a gas is called its **boiling point**. The boiling point of water is 100 °C. Adding heat to boiling water does not raise its temperature.

Salt water does not boil at 100 °C as pure water does. This is because salt water contains dissolved salt particles. The particles of salt dissolved in the water interfere with the change from a liquid to a gas. The temperature of salt water must be higher than 100 °C before the water will boil.

**Describe:** What happens when the temperature of pure water reaches 100 °C?



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**Boiling Point Elevation** The boiling point of a liquid solvent is raised by adding a solute. This special property of all solutions is called **boiling point elevation**. As the amount of solute in the solvent increases, the boiling point of the solvent also increases. Salt water does not boil at the same temperature as pure water because of boiling point elevation.

**Define:** What is boiling point elevation?



**Antifreeze** The engine of a car can get very hot. Water is piped around the engine in a cooling system to keep the engine cool. In summer, the temperature of the water in the cooling system can get very high. Drivers add antifreeze to their car's cooling system to prevent overheating. The antifreeze acts like a solute in a solution. Putting antifreeze in the water of the cooling system raises the boiling point of the water. As a result, the chance of the car overheating is reduced.

**Compare:** How is antifreeze similar to a solute in a solution?

### LESSON SUMMARY

- ▶ The temperature at which a liquid changes to a gas is called its boiling point.
- ▶ Raising the boiling point of a liquid solvent by adding solute is called boiling point elevation.
- ▶ The greater the amount of solute in a solvent, the higher the boiling point of the solvent.
- ▶ Antifreeze is added to a car's cooling system to raise the boiling point of the water.

**Check** Complete the following.

1. The \_\_\_\_\_ of pure water is 100 °C.
2. The boiling point of salt water is \_\_\_\_\_ than the boiling point of pure water.
3. As the amount of solute in a solution increases, the boiling point of the solution \_\_\_\_\_.
4. Raising the boiling point of a liquid solvent by adding solute is called \_\_\_\_\_.
5. Antifreeze added to a car's cooling system \_\_\_\_\_ the boiling point of water in the cooling system.

**Apply** Complete the following.

6. **Compare:** Solution A contains 5 g of sugar dissolved in 100 mL of water. Solution B contains 20 g of sugar dissolved in 100 mL of water. Which solution has the higher boiling point? Explain your answer.
7. **Analyze:** Two beakers each contain 12 g of salt dissolved in water. Beaker 1 contains 200 mL of water while Beaker 2 contains 100 mL of water. Which solution has the higher boiling point? Explain your answer.

### Designing an Experiment

*Design an experiment to solve the problem.*

**PROBLEM:** Does an egg cook faster in tap water or in salt water?

*Your experiment should:*

1. List the materials you would need.
2. Identify safety precautions that should be followed.
3. List a step-by-step procedure.
4. Describe how you would record your data.

## ACTIVITY

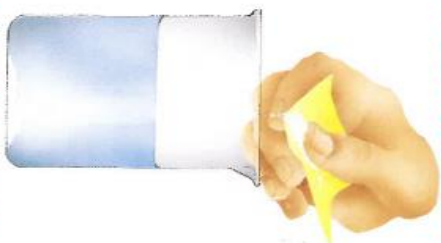
### OBSERVING BOILING POINT ELEVATION

You will need three beakers, a thermometer, a heat source, a spoon, water, and salt.

1. Put 100 mL of water in each beaker.
2. Add 5 g of salt to the first beaker and stir.
3. Heat the water in the beaker until it begins to boil. Record the temperature.
4. Add 10 g of salt to the second beaker and stir. Repeat Step 3.
5. Add 20 g of salt to the third beaker and stir. Repeat Step 3.

### Questions

1. What was the boiling point of the first solution?
2. What was the boiling point of the second solution?
3. What was the boiling point of the third solution?
4. **Analyze:** What is the relationship between the amount of a solute and the boiling point of a solution?



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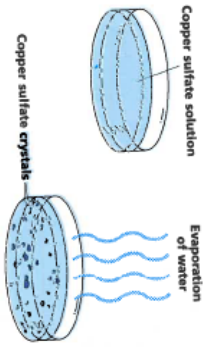
# How can a solution be separated?

**Objective** ▶ Describe two methods for separating the solute from the solvent in a solution.

**TechTerms**

- ▶ **condensation** (kah-n-dun-SAY-shun): change of a gas to a liquid
- ▶ **distillation** (dis-tih-LAY-shun): process of evaporating a liquid and then condensing the gas back into a liquid
- ▶ **evaporation** (i-vap-uh-RAY-shun): change of a liquid to a gas at the surface of the liquid

**Evaporation** A solute can be separated from a solution by evaporation. **Evaporation** (i-vap-uh-RAY-shun) is the change of a liquid to a gas at the surface of the liquid. The molecules at the surface of the liquid gain enough energy to break free of the liquid and move into the air as a gas.



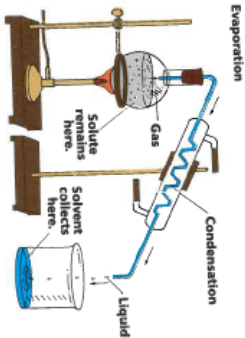
Suppose you wanted to separate copper sulfate crystals from a solution of copper sulfate and water. You could place the solution in a shallow dish and let it stand. After a few days, all the water would evaporate. Crystals of copper sulfate would remain in the bottom of the dish.

▶ **Infer:** How could salt be separated from a saltwater solution?

**Condensation** Have you ever come out of a hot shower to find drops of water on your bathroom mirror? The drops of water are the result of condensation. **Condensation** (kah-n-dun-SAY-shun) is the change of a gas to a liquid. Some of the shower water evaporates to form steam. When the steam strikes the mirror, it is cooled. This causes the steam to change back to liquid water.

▶ **Define:** What is condensation?

**Distillation** A solution can be separated into its solute and solvent by the process of distillation. **Distillation** (dis-tih-LAY-shun), in the process of distillation, a liquid is heated until it evaporates. The gas is then cooled until it condenses back into a liquid.



When a solution is distilled, both the solvent and the solute can be recovered. The solution to be separated is heated. The solvent evaporates and forms a gas. The gas moves through a tube called a condenser. The condenser cools the gas back to a liquid. The liquid drips into a container. The solute remains in the original container. Both the solute and the solvent are recovered. Use grades 6-8 science to learn more about distillation.

▶ **Identify:** What two processes are involved in distillation?

Look! The condenser is surrounded by a cooling jacket.

**LESSON SUMMARY**

- ▶ Evaporation is the process by which a liquid changes to a gas at the surface of the liquid.
- ▶ Condensation is the process by which a gas changes to a liquid.
- ▶ Distillation is the process of heating a liquid until it evaporates and then cooling the gas until it condenses back into a liquid.

**CHECK** Complete the following.

1. Evaporation changes a liquid to a \_\_\_\_\_.
2. Condensation changes a gas to a \_\_\_\_\_.
3. A solution can be separated into its solute and solvent by \_\_\_\_\_.
4. As a liquid is heated, the molecules at the liquid's \_\_\_\_\_ evaporate first.
5. A solvent can be evaporated from a solution to recover the \_\_\_\_\_.

**APPLY** Complete the following.

6. **Infer:** What causes steam to escape from the spout of a tea kettle?
7. Why do droplets of water form on the top of a pot of boiling water?

**Skill Builder**

**Researching** Distillation can be used to purify water. Chemists and pharmacists use distilled water to make solutions. Distilled water is also used in car batteries. Use library references to find out how distilled water is prepared. Why is it sometimes important to use distilled water instead of ordinary tap water? Write a brief report of your findings.

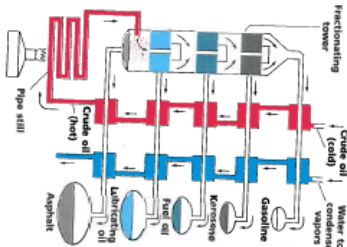
## TECHNOLOGY AND SOCIETY

### FRACTIONAL DISTILLATION OF PETROLEUM

Petroleum is a mixture of different substances. Gasoline, kerosene, and heating oil are just some of the products obtained from petroleum. Before people can use petroleum, these substances must be separated.

Petroleum is separated by the process of fractional distillation. In this process, petroleum is heated in a fractionating (FRAY-shun-ay-ting) tower. The different substances in petroleum have different boiling points. Each substance, or fraction, changes to a vapor at a different temperature. The process of fractional distillation depends on each substance's boiling point.

As the temperature in the fractionating tower increases, each substance changes to a vapor. The vapors pass through pipes where they cool and condense. Then they collect separately. The substances with the highest boiling points cool and condense and drain from the lower part of the tower. These substances include asphalt and lubricating oil. Substances that boil at a lower temperature rise higher in the tower before they cool and condense. Fuel oil and kerosene drain off from the middle of the tower. Gasoline and diesel oil rise to the top of the tower and drain off. Once the petroleum is separated into liquid fractions, each liquid drains into its storage tank.





# 19-B How are crystals formed?

- Objectives** ▶ Describe the shape of some crystals.  
 ▶ Explain how crystals are formed from solutions.

**Term**

- ▶ **supersaturated solution:** solution containing more solute than it can normally hold at a given temperature

**Salt Crystals** A solution of sodium chloride and water can be separated by evaporation. The water evaporates from the solution. Crystals of sodium chloride remain in the container. If you were to examine the crystals with a magnifying lens, you would see that salt crystals all have the same shape. Each salt crystal has the shape of a cube. The size of the crystals may be different, but their shape is always a cube.

**Describe:** What is the shape of a salt crystal?

**Crystal Shapes** The particles that make up a crystal are arranged in a pattern. This pattern gives the crystal a definite shape. All crystals of the same substance have the same shape. Scientists have found that crystals have six basic shapes. The shape of a crystal helps scientists identify unknown substances. Figure 1 shows crystals of copper sulfate.

**Infer:** Why are all salt crystals shaped like a cube?



Figure 1 Copper sulfate crystals

**Growing Crystals** One way to grow crystals is to evaporate the solvent from a solution. Another way is to use a **supersaturated solution**. A supersaturated solution contains more solute than it can normally hold at a given temperature. A supersaturated solution can be made from a saturated solution. The saturated solution holds all the solute it can at a given temperature. When a saturated solution is heated, it can hold more solute. If more solute is added, when the solution cools, it will contain more solute than it would normally hold at the cooler temperature. It is a supersaturated solution.

Figure 2 shows how to grow crystals from a supersaturated solution. First, prepare a supersaturated solution of copper sulfate. Let the solution cool to room temperature. Then add a small copper sulfate crystal to the solution. This extra copper sulfate causes new crystals to form.

**Define:** What is a supersaturated solution?

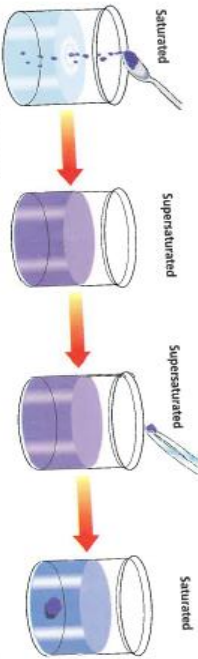


Figure 2 Growing crystals

**LESSON SUMMARY**

- ▶ Crystals of the same substance have the same shape.
- ▶ There are six basic crystal shapes.
- ▶ A supersaturated solution contains more solute than it would normally hold at a given temperature.
- ▶ Crystals form when extra solute is added to a supersaturated solution.

**CHECK** Complete the following.

1. When water is evaporated from a saltwater solution, salt \_\_\_\_\_ remain.
2. All salt crystals are shaped like a \_\_\_\_\_.
3. A supersaturated solution contains more \_\_\_\_\_ than it would normally hold at a given temperature.
4. Heating a \_\_\_\_\_ solution and then adding more solute will form a supersaturated solution.

**Skill Builder**

**Organizing Information** When you organize information, you put the information in some kind of order. Draw a chart showing the six basic crystal shapes. Use library references to identify a substance whose crystals have each type of shape.

5. Crystals form when extra \_\_\_\_\_ is added to a supersaturated solution.

**APPLY** Complete the following.

6. **Predict:** What will happen when sugar is added to a supersaturated solution of sugar and water?
7. Suppose you want to identify an unknown substance. You discover that crystals of the substance are shaped like cubes. What could this substance be? How do you know?

**ACTIVITY**

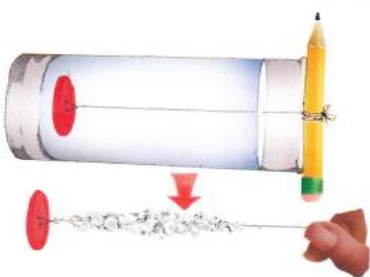
**GROWING SUGAR CRYSTALS**

You will need a glass, boiling water, a spoon, sugar, string, a button, and a pencil.

1. Add some sugar to a half cup of boiling water until no more sugar will dissolve. **Caution:** Be careful not to spill the boiling water on yourself.
2. Pour the sugar solution into a glass.
3. Tie a clean piece of wet string to the pencil. Dip the string in sugar.
4. Tie a button to the end of the string. Place the pencil across the top of the glass so that the string hangs in the water.
5. Let the solution stand for several days.

**Questions**

1. **Observe:** What formed on the string after several days?
2. Was the sugar solution saturated or supersaturated? Explain.
3. **Analyze:** What caused the result you observed?



# Unit 19 Challenges

**STUDY HINT** Before you begin the Unit Challenges, review the TechTerms and Lesson Summary for each lesson in this unit.

<b>TechTerms</b>	boiling point (356)	evaporation (358)	soluble (346)
	boiling point elevation (356)	freezing point (354)	solute (346)
	concentrated solution (352)	freezing point depression (354)	solution (344)
	condensation (358)	insoluble (346)	solvent (346)
	dilute solution (352)	polar molecule (348)	supersaturated solution (360)
	dissolve (344)	saturated solution (352)	unsaturated solution (352)
	distillation (358)		

## TechTerm Challenges

Matching Write the TechTerm that matches each description.

- molecule in which one end has a positive charge and the other end has a negative charge
- temperature at which a liquid changes to a solid
- solution containing more solute than it can normally hold at that temperature
- change of a gas to a liquid
- temperature at which a liquid changes to a gas
- lowering the freezing point of a liquid solvent by adding solute
- mixture in which one substance is evenly mixed with another substance
- substance in which a solute dissolves
- solution containing less solute than it can hold at a given temperature

Identifying Word Relationships Explain how the words in each pair are related. Write your answers in complete sentences.

- soluble, insoluble
- dissolve, solute
- distillation, evaporation
- concentrated solution, dilute solution
- solute, saturated solution
- boiling point elevation, solute



## Content Challenges

True/False Write true if the statement is true. If the statement is false, change the underlined term to make the statement true.

- Stirring a solution speeds up the rate at which a solute dissolves.
- The freezing point of salt water is higher than that of pure water.
- Crystals form when extra solute is added to an unsaturated solution.
- The ends of a water molecule are electrically charged.
- The substances in a solution are evenly mixed.

## Understanding the Features

Reading Critically Use the feature reading selections to answer the following. Page numbers for the features are in parentheses.

- What do analytical chemists do? (345)
- How can fishes survive in the cold water of the Arctic Ocean? (355)
- Contrast: How are mechanical weathering and chemical weathering different? (347)
- Inter: Why is the work of water purification chemists important? (349)
- What is the process by which petroleum is broken down into different products? (359)
- A cement sidewalk is soluble in rainwater.
- The solvent in a solution of sugar and water is sugar.
- As the amount of solute in a solution increases, the boiling point of the solution decreases.
- A dilute solution contains less solute than solvent.
- A saturated solution can be made unsaturated by cooling the solution.

Completion Write the term that best completes each statement.

- Extra solute sitting at the bottom of a solution indicates the solution is \_\_\_\_\_.
- As the amount of solute in a solution increases, the \_\_\_\_\_ of the solution also increases.
- In distillation, a liquid \_\_\_\_\_ and then condenses.
- For a solution to form, a \_\_\_\_\_ must dissolve in a solvent.
- Crystals of the same substance have the same \_\_\_\_\_.
- Powdered sugar dissolves \_\_\_\_\_ than a sugar cube.
- The \_\_\_\_\_ of pure water is 0 °C.
- Adding antifreeze to a car's cooling system raises the \_\_\_\_\_ of the water. It contains.
- Placing rock salt on an icy sidewalk lowers the \_\_\_\_\_ of melted ice.
- As water is heated to its boiling point, molecules at the water's \_\_\_\_\_ evaporate.

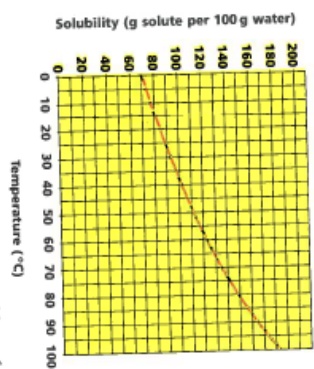
## Concept Challenges

Critical Thinking Answer each of the following in complete sentences.

- The law of conservation of matter states that matter cannot be created or destroyed, but only changed from one form to another. How does the evaporation of water support this law?
- Compare the effect of an increased amount of solute on both the boiling point and the freezing point of a solution.
- How could information about crystal shape be used to identify an unknown substance?
- Hypothesize: What effect does evaporation have on the earth's oceans?
- Club soda contains carbon dioxide gas dissolved in liquid water. Explain why a bottle of club soda goes "flat" when it is left opened at room temperature.



**Interpreting a Graph** Use the graph showing the solubility of sodium nitrate in water to answer the following questions.



1. How many grams of sodium nitrate can be dissolved in 100 g of water at a temperature of 50 °C?
2. At what temperature will 100 g of water dissolve 160 g of sodium nitrate?
3. How much sodium nitrate can be dissolved in 100 g of water at a temperature equal to the boiling point of pure water?
4. How much sodium nitrate can be dissolved in 100 g of water at a temperature equal to the freezing point of pure water?
5. **Analyze:** What is the relationship between the temperature of a solvent and the amount of solvent it can dissolve?

### Finding Out More

1. Water that contains dissolved minerals is called hard water. Use library references to find out what effect hard water has on pipes and plumbing fixtures. Present your findings to the class.
2. Directions on a box of pasta or spaghetti often say to cook the product in salted, boiling water. Use cookbooks to determine why this is the best way to cook pasta.
3. Honey is an example of a supersaturated solution. Design an experiment by which crystals could be made to grow in honey.
4. Pure drinking water can be made from salt water by the process of distillation. Design an experiment by which salty, ocean water could be distilled to produce pure water and dissolved salts.

## Handouts

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

**19-1 What is a solution?****Lesson Review**

Write true if the statement is true. If the statement is false, change the underlined term to make the statement true. Write your answers in the spaces provided.

- \_\_\_\_\_ 1. A mixture in which one substance is evenly mixed with another substance is a solution.
- \_\_\_\_\_ 2. Club soda is a solution of hydrogen dissolved in water.
- \_\_\_\_\_ 3. Sand dissolves in water.
- \_\_\_\_\_ 4. Salt water is formed when a solid dissolves in a gas solution.
- \_\_\_\_\_ 5. A solution can be formed when a gas dissolves in a gas.
- \_\_\_\_\_ 6. When a substance goes into a solution, it dissolves.
- \_\_\_\_\_ 7. Alcohol dissolved in water is an example of a gas dissolved in a solid solution.
- \_\_\_\_\_ 8. Water vapor in air is an example of a liquid dissolved in a gas solution.
- \_\_\_\_\_ 9. Sand mixes evenly with water.
- \_\_\_\_\_ 10. In a sugar water solution, particles of sugar are evenly mixed with molecules of water.

**Skill Challenge**

**Skills:** identifying, relating

Write "Yes" if the substance is a solution and "No" if it is not a solution. Then identify the state of substances being mixed in each solution.

Substance	Solution?	State of Substances Mixed
1. Salt water		
2. Air		
3. Balloon filled with hydrogen		
4. Ink on paper		
5. Carbonated soda		
6. Soap powder in water		

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

**19-2 What are the parts of a solution?****Lesson Review***Complete the following.*

1. The \_\_\_\_\_ in a salt water solution is salt.
2. A substance is said to be \_\_\_\_\_ if it is able to dissolve.
3. In a solution of club soda, \_\_\_\_\_ is the solvent.
4. Concrete is \_\_\_\_\_ in water.
5. The part of a solution in which the solute dissolves is the \_\_\_\_\_.
6. Sugar is \_\_\_\_\_ in oil.
7. The part of a solution that dissolves is called the \_\_\_\_\_.
8. When a substance does not dissolve in another substance, it is said to be \_\_\_\_\_.
9. In a club soda solution, \_\_\_\_\_ is the solute.
10. Sand is \_\_\_\_\_ in water.

**Skill Challenge****Skills:** *identifying, synthesizing**Identify the solute and solvent in each of the following solutions.*

Solution	Solute	Solvent
1. Sea water		
2. Coffee		
3. Club soda		
4. Water vapor		
5. Hot chocolate		

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### 19-5 What is the concentration of a solution?

#### Lesson Review

Complete the following.

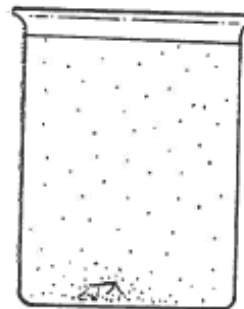
1. A strong solution has a \_\_\_\_\_ amount of dissolved solute.
2. A solution that contains less solute than it can hold at a given temperature is said to be \_\_\_\_\_.
3. As the temperature of a solvent \_\_\_\_\_, the amount of solute it can hold decreases.
4. A solution is said to be \_\_\_\_\_ if it can hold more solute than it already contains.
5. Weak solutions are called \_\_\_\_\_ solutions.
6. When some solute remains at the bottom of a solution, the solution is said to be \_\_\_\_\_.
7. Strong solutions are called \_\_\_\_\_ solutions.
8. Heating a saturated solution often causes it to become \_\_\_\_\_.
9. A solution that contains all the solute it can hold at a given temperature is said to be \_\_\_\_\_.
10. A weak solution has a \_\_\_\_\_ amount of dissolved solute.

#### Skill Challenge

*Skills: applying, interpreting a diagram*

Use the diagram to answer the following questions.

1. Is the solution shown in the diagram saturated or unsaturated?  
How do you know? \_\_\_\_\_  
\_\_\_\_\_
2. What would likely happen if more solvent was added to the beaker and then stirred? \_\_\_\_\_
3. What effect would heating the beaker and its contents have on the solution? \_\_\_\_\_



## Concentration of a solution

To relate the *quantity of solute* to the quantity of *solvent*, we use a new magnitude called *concentration*.

The **concentration** of a solution is the quantity of solute dissolved in a specific quantity of solvent or solution.

$$\text{concentration} = \frac{\text{quantity of solute}}{\text{quantity of solvent or solution}}$$

Concentration can be expressed in various ways:

- **Mass concentration (or concentration in grams per litre)**

$$\text{Mass concentration} = \frac{\text{mass of solute (g)}}{\text{volume of solution (L)}}$$

For example, a solution of 10 g/L contains 10 g of solute in 1 L of solution.

- **Mass percent**

$$\%m = \frac{\text{mass of solute}}{\text{mass of solution}} \cdot 100\%$$

For example, a solution of 10 %m contains 10 g of solute in 100 g of solution.

- **Volume percent**

$$\%vol. = \frac{\text{volume of solute}}{\text{volume of solution}} \cdot 100\%$$

It is used, basically, for *liquids in liquids* solutions.

For example, wine contains about 12%vol., which means there are 12 mL of alcohol in every 100 mL of wine.

## Complementary activities: SOLUTIONS-CONCENTRATION

1. Calculate the mass concentration, expressed in  $g/L$ , of a solution of  $500\text{ mL}$  resulting from dissolving  $4\text{ g}$  of salt (sodium chloride) in water.
2. To a container filled with  $150\text{ L}$  of water,  $3\text{ kg}$  of salt are added. Calculate the concentration obtained and express it in:
  - a)  $g/L$
  - b)  $kg/m^3$
  - c)  $hg/L$
  - d)  $g/m^3$
3. Order these solutions from higher to lower concentration:  $350\text{ hg/L}$ ,  $200\text{ g/m}^3$ ,  $150\text{ g/L}$ ,  $50\text{ kg/hL}$ .
4. At  $25^\circ\text{C}$ , the solubility of sodium chloride in water is  $360\text{ g/L}$  (concentration of the saturated solution). What does this statement mean?
5. To make  $2\text{ L}$  of a solution,  $25\text{ g}$  of sugar are dissolved in water. Calculate the mass concentration and express it in:
  - a)  $g/L$
  - b)  $kg/L$
  - c)  $kg/m^3$
  - d)  $g/hL$
6. How would you prepare  $250\text{ mL}$  of a solution of common salt ( $\text{NaCl}$ ) in water at a concentration of  $10\text{ g/L}$ ?



7. A solution with 3 g of potassium chloride (KCl) in 100 g of water is prepared. Calculate the percent of mass of solute in the solution.
8. If the density of a salty water solution is 1.2 kg/L, how much salt will you have to weigh to prepare 200 mL of this solution at 10% m.?
9. To make 8 m<sup>3</sup> of a solution, 2 kg of sugar are dissolved in water. What is the concentration in g/L of this solution?
10. You want to prepare 0.5 L of a solution of sodium hydroxide (NaOH) at a concentration of 56 g/L. What mass of solute will you need to weigh?
11. A glucose solution is 30% mass. How much glucose and water has 100 g of solution?
12. A bottle of wine has a volume of 1 L. The label on the bottle indicates that this wine is 12% vol. Which is the volume of alcohol contained in this bottle?

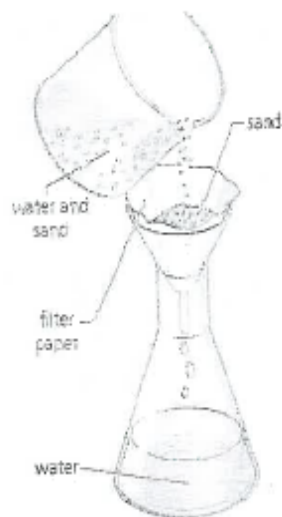
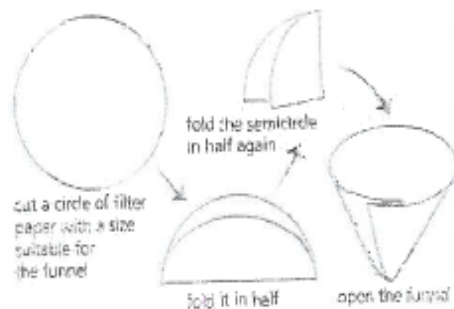
## Separation of components in heterogeneous mixtures

Some methods to separate components in heterogeneous mixtures are:

### - Filtration (or filtering)

This is used to separate mixtures formed of a not dissolved solid substance and a liquid.

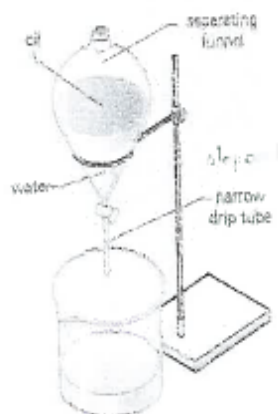
Example: separation of a mixture of sand and water.



### - Decantation

This is used to separate two insoluble (= immiscible) liquids.

Example: separation of water and oil.



### - Magnetic separation

When one of the substances has magnetic properties, a magnet is used to separate the mixture.

Example: separation of a mixture of iron filings and sulphur.

## Reading comprehension

### *Fractional distillation of petroleum*

**Name:** .....

Read carefully the text at **page 359** (*Technology and society: Fractional distillation of petroleum*) and also this extension:

*In a sense, petroleum is stored sunlight. Solar energy was absorbed by organisms in the oceans 300 to 400 million years ago. The organisms used the sun's energy to make organic compounds. When they died, the organisms settled on the ocean floor and were covered by layers of sediments. Under great heat and pressure, the sediments became rock and their organic compounds were converted into petroleum.*

Then, answer the following questions.

1. Translate into Spanish the following words or expressions:

*heating oil* =

*fractional distillation* =

*pipes* =

*drain* =

*storage tank* =

*stored sunlight* =

2. What are three products that are found in petroleum?

3. What is the purpose of a condenser in fractional distillation?

4. According to the text and the diagram, what substance has a higher boiling point, kerosene or fuel oil? Why do you think that?

5. Is there any important relationship between this reading and the town where we live (A Coruña)?

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

**19-8 How can a solution be separated?****Lesson Review**

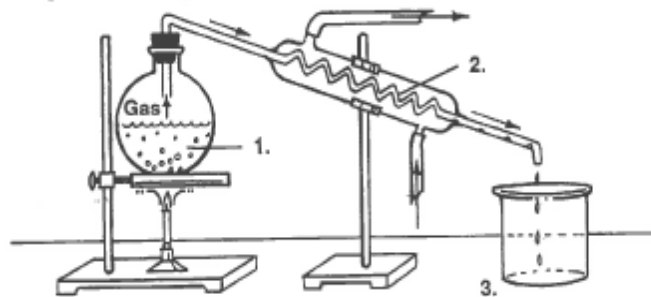
Write true if the statement is true. If the statement is false, change the underlined term to make the statement true. Write your answers in the spaces provided.

- \_\_\_\_\_ 1. In the process of distillation, a liquid is heated until it condenses.
- \_\_\_\_\_ 2. Drops of water on a bathroom mirror after a shower is an example of evaporation.
- \_\_\_\_\_ 3. A solute can be separated from a solution by evaporation.
- \_\_\_\_\_ 4. When a solution is distilled, both the solvent and the solute can be recovered.
- \_\_\_\_\_ 5. A substance changes from a gas to a liquid by evaporation.
- \_\_\_\_\_ 6. The process of distillation begins and ends with a substance in liquid form.
- \_\_\_\_\_ 7. The change of a liquid to a gas at the surface of the liquid is called condensation.
- \_\_\_\_\_ 8. During distillation, gas moves through a tube called a condenser.
- \_\_\_\_\_ 9. During the process of evaporation, molecules move into the air as a liquid.
- \_\_\_\_\_ 10. Distillation involves the processes of evaporation and condensation.

**Skill Challenge**

**Skills:** identifying, relating

Identify what is occurring in each part of the diagram:



PART 1 \_\_\_\_\_

PART 2 \_\_\_\_\_

PART 3 \_\_\_\_\_

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

Partner's names \_\_\_\_\_

## Lab activity report

Title: *Making a solution*

### Purpose

Make a solution of copper sulfate with a definite concentration and volume:

SOLUTION	CONCENTRATION (g/L)	VOLUME
Copper sulfate in water		100 mL

### Materials

Complete. Items needed to do the experiment:



### Procedure

Steps needed to do the solution:

1. Calculate the mass of solute that you need.

$$\dots \text{ g/L} \cdot \dots \text{ L} = \dots$$

2. Weigh that amount of solute on the balance using a watch glass (before that, make sure the balance is centered properly).

- Weigh the watch glass without solute.
- Slide the riders until the mass you need.
- Add solute using the spoon until the scale is balanced.

3. Put the solute into a beaker.

4. Add some water and stir the mixture using a stirring rod in order to dissolve the solute.

5. Pour the solution into a 100 mL flask.

6. Pour water until complete the volume (be careful at the final part of the flask tube; in this part, use the dropper in order not to pass the 100 mL level).

## Lab activity report

**Title:** *Separating components in a heterogeneous mixture*

### **Purpose**

*Separate components in a mixture of iron filings, emery (a type of sand) and salt.*

### **Materials**

*Items needed to do the experiment:*

*Heterogeneous mixture of iron filings, emery (a type of sand) and salt; water; magnet, beakers, stirring rod, filter paper, funnel, Erlenmeyer flask, Petri dish.*

### **Procedure**

**Complete.** *Steps needed to do the experiment:*

*(Draw some pictures if necessary).*



Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

Partners' names \_\_\_\_\_

## Lab activity report

**Title:** *Measuring densities.*

**Background** *(What is density?, How can you measure density?).*

### **Purpose**

*In this experiment, you are measuring the density of solids and liquids.*

### **Materials**

Items needed to do the experiment:

### **Procedure**

Steps needed to do the experiments: *(you can use drawing to answer this part)*

*- Measuring liquids densities:*



--

- Measuring solids densities:

Solid 1	Solid 2

**Observations** (List the different bodies and their densities).

	$m$ (g)	$V$ (cm <sup>3</sup> )	Density (g/cm <sup>3</sup> )
<b>Liquid 1</b>			
<b>Liquid 2</b>			
<b>Solid 1</b>			
<b>Solid 2</b>			

**Conclusions** (Could you say what liquids and metals you have on your table lab?; look at the table of densities in your book. Use more sheets if needed)

	Density (g/cm <sup>3</sup> )	Material
<b>Liquid 1</b>		
<b>Liquid 2</b>		
<b>Solid 1</b>		
<b>Solid 2</b>		Wood



## Exam

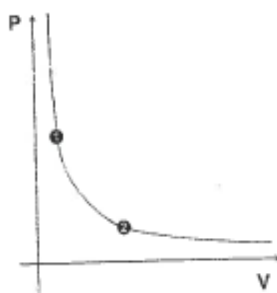
Name: \_\_\_\_\_

Class: 2<sup>nd</sup>ESODate: 22<sup>nd</sup> March**2<sup>nd</sup> term EXAM (100 p.)****Calculating (14 p.)**

1. (2 p.) A balloon at 290 K, occupies a volume of 1 L. What volume will it occupy if it is heated to 320 K?
2. (2 p.) Inside a tyre at 20°C, the air pressure is  $2 \cdot 10^6$  Pa. If the tyre warms up because of friction with the road until reaching a temperature of 45°C, what air pressure will the tyre have, supposing air volume to be constant?
3. (2 p.) Calculate the mass concentration, expressed in g/L, of a solution of 200 mL resulting from dissolving 2 g of salt (sodium chloride) in water.
4. (2 p.) Order these solutions from higher to lower concentration: 350 hg/L, 200 g/m<sup>3</sup>, 150 g/L, 50 kg/hL.
5. (2 p.) A solution with 5 g of potassium chloride (KCl) in 100 g of water is prepared. Calculate the percent of mass of solute in the solution.
6. (2 p.) You want to prepare 200 mL of a solution of sodium hydroxide (NaOH) at a concentration of 50 g/L. What mass of solute will you need to weigh?
7. (2 p.) A bottle of wine has a volume of 1.5 L. The label on the bottle indicates that this wine is 12%vol. Which is the volume of alcohol contained in this bottle?

**Interpreting diagrams (20 p.).**

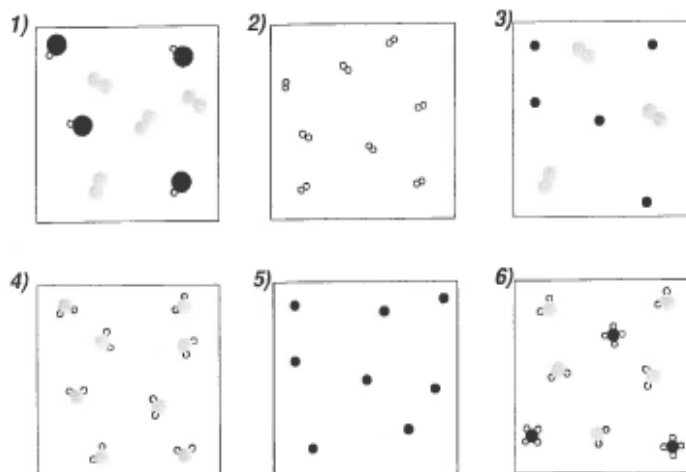
1. (5 p.) Complete the following questions according to the graph below.



- The graph represents the relation between pressure and volume in a gas at constant \_\_\_\_\_.
- It represents one of the gases laws called: \_\_\_\_\_ law.
- This law states that \_\_\_\_\_  
\_\_\_\_\_
- The pressure in the state 1 is \_\_\_\_\_ than the pressure in the state 2.
- The volume in the state 1 is \_\_\_\_\_ than the volume in the state 2.

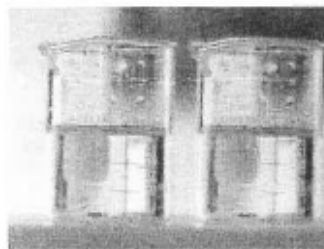
2. (6 p.) Answer the following questions according to the pictures representing atoms or/and molecules in gases:

- Container(s) with an only element: \_\_\_\_\_ (write the number or numbers).
- Container(s) with an only compound: \_\_\_\_\_
- Container(s) with a mixture of two elements: \_\_\_\_\_
- Container(s) with a mixture of two compounds: \_\_\_\_\_
- Container(s) with a mixture of one element and one compound: \_\_\_\_\_
- A particular substance in the container number 4 could be \_\_\_\_\_.



3. (5 p.) Write *A*, *B* or *both* in the spaces provided, in order to match the parts of the diagram below with the following descriptions:

- Water is the solvent: \_\_\_\_\_
- More concentrated solution: \_\_\_\_\_
- Salt is the solute: \_\_\_\_\_
- More diluted solution: \_\_\_\_\_
- The concentration is 17g/L: \_\_\_\_\_

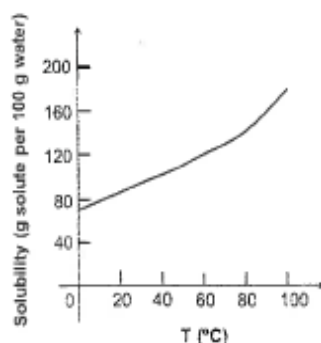


A  
30 mL of water  
0.5 g of salt

B  
30 mL of water  
5 g of salt

4. (4 p.) Use the graph showing the solubility of sodium nitrate in water (the concentration of the saturated solution) to answer the following questions.

- How many grams of sodium nitrate can be dissolved in 100 g of water at a temperature of 60°C?  
\_\_\_\_\_
- At what temperature will 100 g of water dissolve 160 g of sodium nitrate? \_\_\_\_\_
- Could you dissolve 100 g of this solute in 100 g of water at 10°C? Explain the answer.  
\_\_\_\_\_
- What is the relationship between the temperature of a solvent and the amount of solid solute it can dissolve? \_\_\_\_\_



**Multiple Choice (37 p.).** Write the letter of the term or phrase that best completes each statement in the space provided.

- \_\_\_\_\_ 1. Which of the following substances are not solutions?  
a. sugar. b. salty water. c. air. d. brass.
- \_\_\_\_\_ 2. If a gas is compressed at constant temperature, the volume  
a. decreases. b. remains the same. c. increases. d. depends on the gas.
- \_\_\_\_\_ 3. Gas produces pressure because their particles:  
a. are packed together. b. slide past each other. c. bump against the walls of the container. d. move freely.
- \_\_\_\_\_ 4. A solution of solid in solid is called:  
a. concrete. b. colloid. c. alloy. d. soluble.
- \_\_\_\_\_ 5. What happens to the pressure of a certain gas if its volume increases two times (it is double) at constant temperature?  
a.  $P$  increases two times. b.  $P$  decreases two times. c.  $P$  is constant. d.  $P$  is  $2Pa$ .
- \_\_\_\_\_ 6. What happens to the volume of a certain gas if its temperature becomes double at constant pressure?  
a.  $V$  increases two times. b.  $V$  decreases two times.. c.  $V$  is constant. d.  $V$  will be  $2L$ .
- \_\_\_\_\_ 7. A solution of  $10\%m$ . contains:  
a. 1 g of solute in 100 g of solution. b. 10 g of solute in 100 g of solvent. c. 10 g of solute in 90 g of solvent. d. 10 kg of solute in 100 g of solution.
- \_\_\_\_\_ 8. When a gas is heated, its particles:  
a. move more slowly. b. come together. c. separate more at the same pressure. d. increase in size.
- \_\_\_\_\_ 9. Substance that is dissolved is called  
a. tin. b. insoluble. c. solute. d. solvent.
- \_\_\_\_\_ 10. Extra solute sitting at the bottom of a solution indicates the solution is:

- a. concentrated. b. saturated. c. unsaturated. d. weak.
- \_\_\_\_\_ 11. A solution of 10 g/L contains:  
a. 1 g of solute in 100 mL of solution. b. 2 g of solute in 20 mL of solution. c. 1 g of solute in 10 mL of solution. d. 1 kg of solute in 1 L of solution.
- \_\_\_\_\_ 12. This is the SI unit of pressure:  
a. cubic meter. b. Kelvin. c. Pascal. d. Boyle.
- \_\_\_\_\_ 13. Sugar is made up of the elements carbon, hydrogen and  
a. chlorine. b. zinc. c. oxygen. d. sodium.
- \_\_\_\_\_ 14. Which of the following substances is insoluble in water:  
a. instant coffee. b. oil. c. sugar. d. carbon dioxide.
- \_\_\_\_\_ 15. The chemical symbol for calcium is:  
a. K. b. Al. c. Fe. d. Ca.
- \_\_\_\_\_ 16. The compound formed when hydrogen and oxygen combine chemically is:  
a. salt. b. water. c. sugar. d. carbon dioxide.
- \_\_\_\_\_ 17. Compounds are formed by:  
a. evaporation. b. filtration. c. physical means. d. chemical reactions.
- \_\_\_\_\_ 18. A group of atoms chemically combined is:  
a. a molecule. b. an element. c. a mixture. d. a colloid.
- \_\_\_\_\_ 19. Molecules are made up of two or more:  
a. atoms. b. elements. c. mixtures. d. compounds.
- \_\_\_\_\_ 20. A mixture of salt and water can be separated by  
a. freezing. b. filtering. c. evaporating. d. mixing.
- \_\_\_\_\_ 21. The compound iron sulfide can be formed by:  
a. heating. b. filtering. c. evaporating. d. mixing.
- \_\_\_\_\_ 22. Diatomic molecules contain  
a. one atom. b. two or more atoms. c. two atoms of the same element. d. two atoms of different elements.
- \_\_\_\_\_ 23. It is a pure substance:  
a. seawater b. milk. c. mercury. d. air.
- \_\_\_\_\_ 24. It is a mixture:  
a. oxygen. b. salt. c. tap water. d. sodium.
- \_\_\_\_\_ 25. It is a substance that cannot be broken down in simpler substances:  
a. element. b. compound. c. solution. d. water.
- \_\_\_\_\_ 26. Two or more substances mixed together but not chemically combined:  
a. compound. b. element. c. mixture. d. pure substance.
- \_\_\_\_\_ 27. Components cannot be seen by the naked eye, but they can be seen using an optical microscope:  
a. solution. b. heterogeneous mixture. c. compound. d. colloid.

- \_\_\_\_\_ 28. They are colloids, except:  
a. mayonnaise. b. milk. c. blood. d. salty water.
- \_\_\_\_\_ 29. They are solutions, except:  
a. air. b. tap water. c. granite. d. bronze.
- \_\_\_\_\_ 30. The symbol of ammonia is:  
a.  $\text{NH}_3$ . b.  $\text{H}_2\text{O}$ . c.  $\text{CO}_2$ . d. Ag.
- \_\_\_\_\_ 31. Solutions can be formed when substances dissolve in  
a. solids. b. liquids. c. gases. d. solids, liquids or gases.
- \_\_\_\_\_ 32. A dilute solution is said to be:  
a. weak. b. saturated. c. supersaturated. d. concentrated.
- \_\_\_\_\_ 33. Which of the following substances is called the universal solvent (it is the most important solvent):  
a. oil. b. air. c. water. d. alcohol.
- \_\_\_\_\_ 34. All of the following substances are soluble in water except:  
a. salt. b. concrete. c. sugar. d. carbon dioxide.
- \_\_\_\_\_ 35. A solution that contains more solute than it can normally hold at a given temperature is said to be:  
a. supersaturated. b. unsaturated. c. saturated. d. dilute.
- \_\_\_\_\_ 36. In a saltwater solution, salt is the:  
a. solvent. b. solute. c. solution. d. colloid.
- \_\_\_\_\_ 37. A solution that is saturated at  $70^\circ\text{C}$  will probably dissolve:  
a. more solute at  $40^\circ\text{C}$ . b. less solute at  $80^\circ\text{C}$ . c. more solute at  $90^\circ\text{C}$ . d. the same amount of solute at  $20^\circ\text{C}$ .

**Written Response (12 p.)** Answer the following questions in complete sentences.

1. (2 p.) What is the difference between a solution that is saturated and a solution that is unsaturated.

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2. (2 p.) Why is air a solution? \_\_\_\_\_

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3. (2 p.) Explain why, according to the kinetic molecular theory of matter, pressure increases with temperature in a closed container: \_\_\_\_\_

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\_\_\_\_\_

4. (2 p.) Explain the difference between compound and mixture.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. (4 p.) In what ways are colloids like solutions? In what ways are they different?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**FILL IN (17 p.).** Write the term that best completes each statement.

1. \_\_\_\_\_ is the component more similar to the solution.
2. Hydrogen and oxygen are \_\_\_\_\_ that are gases at room temperature.
3. Solutions are formed when substances \_\_\_\_\_ in other substances.
4. The alloy of copper and zinc is \_\_\_\_\_.
5. Water is always made up of \_\_\_\_\_ atoms of hydrogen and one atom of oxygen.
6. The substances in a mixture have not been \_\_\_\_\_ combined.
7. Steel is a solution of carbon in \_\_\_\_\_.
8. The substances in a compound \_\_\_\_\_ their own properties.
9. Granite is an example of \_\_\_\_\_ mixture.
10. Matter can be classified into pure substances and \_\_\_\_\_.
11. Pure substances can be classified into elements and \_\_\_\_\_.
12. Solutions and colloids are \_\_\_\_\_ mixtures.
13. The symbol for the element \_\_\_\_\_ is Na.
14. Atoms of the same \_\_\_\_\_ are alike.
15. \_\_\_\_\_ of two or more elements can join together to form compounds.
16. Bronze is an example of solution called \_\_\_\_\_.
17. Bronze is a solution of \_\_\_\_\_ in copper.