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Multiple intelligences
and learning strategies: a
proposal to improve CLIL
students' results

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ABSTRACT

Nowadays the concept of intelligence has changed, and a significant number of schools are changing their educational approach around the world too. Similarly, foreignlanguage acquisition has achieved a great importance in the majority of European curriculum. It is for this reason that CLIL approach and the application of multiple intelligences (MI) theory are increasing their presence in the schools.

We consider that both, CLIL approach and MI theory should work together, and we discover there are many different ways to do it. Consequently, the aim of our proposal is to make CLIL learners aware of their MI profile and be able to choose suitable learning strategies according to it. Our proposal is divided in several sections, providing CLIL learners with the opportunity of using their eight intelligences for learning a curriculum topic before learning about MI theory. It also includes a design to teach primary students about MI theory and how to choose learning strategies according to their MI profile, as well as questionnaires to assess the effectivity of our proposal when implemented. Therefore, this consists in the design of a CLIL module for primary education, two sessions about multiple intelligences theory and learning strategies and two questionnaires.

To support our proposal, we have made a review of learning strategies, learning styles, MI theory and CLIL literature. We address the main features of all these concepts and explain the connection between MI theory and learning styles, and how both theories can support learning strategies selection.

Finally, we contemplate the possibility of adapting the proposal to higher levels of education, subjects and topics. Secondary education students need learning strategies, as much as primary students do, and know more about themselves which can be beneficial for MI profile awareness.

Key words:

Multiple intelligences, learning strategies, learning styles, Content and Language Integrated Learning (CLIL), primary education

TABLE OF CONTENTS

1. INTRODUCTION	4
1.1. JUSTIFICATION OF THE RESEARCH	5
1.2. BRIEF ANALYSIS OF THE STATE OF THE ART.....	7
1.3. OBJECTIVES	8
1.4. METHODOLOGY	8
2. LITERATURE REVIEW.....	8
2.1. LEARNING STRATEGIES.....	9
2.1.1. Definition of the concept	9
2.1.2. Learning strategies and academic results:.....	10
2.1.3. Learning styles and academic results.....	12
2.2. MULTIPLE INTELLIGENCES.....	13
2.2.1. Critiques against and in favour of MI theory.....	13
2.2.2. Definition of intelligence	15
2.2.3. MI profile	16
2.2.4. Common points of MI and learning styles	18
2.2.5. MI theory application in the classroom.....	19
2.3. HOW TO APPLY MI THEORY, LEARNING STYLES, AND LEARNING STRATEGIES IN A CLIL CONTEXT	21
2.3.1 CLIL approach for bilingual contexts.....	21
2.3.2 Application of the theories: MI theory, learning styles and learning strategies in the CLIL context.....	24
3. INTERVENTION PROPOSAL.....	25
3.1. TARGET GROUP.....	26
3.2. OBJECTIVES.....	26
3.3. METHODOLOGY OF THE PROPOSAL.....	27
3.4. INITIAL AND FINAL QUESTIONNAIRES.....	28
3.4.1. Design and validation.....	28
3.4.2. Distribution of the questionnaires	32
3.4.3 Data analysis: procedure	32
3.5. DESIGN OF THE CLIL SESSIONS.....	33
3.5.1. Objectives	33

3.5.2. Methodology	34
3.5.3. Timing and planning	37
3.5.4. Sessions and activities	39
3.5.5. Assessment	47
3.6. MULTIPLE INTELLIGENCES LESSONS.....	52
3.6.1. First lesson	52
3.6.2. Second lesson	54
4. DISCUSSION	56
5. CONCLUSION	57
6. FUTURE RESEARCH LINES AND LIMITATIONS	59
7. REFERENCES.....	60
ANNEX I. "MI checklist for students". Teacher's questionnaire	62
ANNEX II. Initial questionnaire. Students' questionnaire	64
ANNEX III. Final questionnaire	68
ANNEX IV. Analysis of questionnaires: questionnaires' results' sheet.....	71
Annex V. Intelligences related to the questionnaires	72
ANNEX VI. Validation of the questionnaires.....	73
ANNEX VII. KWL Chart	75
ANNEX X. Experiment: The greenhouse effect.....	76

LIST OF TABLES

Table 1 Learning strategies for CLIL students	12
Table 2 Classroom activities for each intelligence	20
Table 3 Initial questionnaire matrix.....	30
Table 4 Final questionnaire matrix.....	30
Table 5 Sessions' matrix plan	38-39
Table 6 Stations of the first week	41-42
Table 7 MI stations for Bodily-kinesthetic, linguistic and logical-mathematical intelligences	43
Table 8 Intrapersonal intelligence sheet	45
Table 9 Rubric for the assessment of the advertisement.....	48-49
Table 10 Folder checklist	50
Table 11 Self-assessment sheet for learners	51

LIST OF FIGURES

Figure 1 Intervention proposal structure	28
Figure 2 The 4 Cs in the CLIL sessions.....	37
Figure 3Definition of intelligence to explain students	53
Figure 4 Type of intelligences.....	54

1. INTRODUCTION

This dissertation investigates if multiple intelligence theory can help to create learning strategies that can be taught to CLIL students. To research this topic, we have designed an intervention proposal based on the literature about multiple intelligences theory, learning strategies and CLIL approach.

This work will be justified in the following section in which we will explain the importance of studying a particular application of multiple's intelligence theory in a CLIL environment. Secondly, we will summarize the literature content in the "brief analysis of the state of the art" and present our main and specific objectives, ending the section with the methodology we plan to achieve our purposes.

The dissertation continues with the literature review, divided in 3 main subsections. In the first of them, we will explain what learning strategies are, explain their relation with the academic results and with learning styles. The second one is focused on the multiple intelligence's theory, what has been said in favour and against the theory, what the theory defends, how the theory connects to the concepts of sensorial learning styles and how it can be applied it in the schools. The section ends with the revision of CLIL approach and how MI theory, learning styles and learning strategies can be used in the classrooms together.

After that, we will start the description of the intervention proposal. The proposal begins describing the context in which the intervention will take place, the objectives of the intervention and the methodology that will be followed. Then, we focus on the design of the questionnaires, the presentation of the CLIL module (objectives, methodology, timing, sessions, activities and assessment), and finally the design of two sessions about multiple's intelligence theory.

Once we have provided all the details of our proposal, we will discuss and give some conclusions about the study. We finish this dissertation commenting on the limitations of the study and giving some suggestions for further research.

1.1. JUSTIFICATION OF THE RESEARCH

Recently, there has been a growing interest in the multiple intelligence's theory (MI) established by Howard Gardner in 1983. This theory means a change in the definition of intelligence and how to measure it, which has caused a revolution in psychology and many attempts of apply the theory in the educational field.

Experts from different parts of the world have designed and implemented educational proposals in schools and universities such as Christison (1996), and Gahala & Lange (1997, cited by Pérez and Beltrán, 2006) in American schools; and Prieto & Ferrández (2001), and Pérez & Domínguez (2000, 2005) in Spain. The interest in the theory and its implications for the learning and teaching world has already provoked the design of activities to make students aware of their MI profile in the CLIL context, as we can see in the work of Dale & Tanner (2012). However, very little attention has been paid to how the awareness of the MI profile can help bilingual learners to improve their academic results.

Furthermore, nowadays it is also important to pay attention to the high speed with which the educational curricula around Europe is changing. Since the European government officials developed the Lifelong Learning programmes in the 2000s, the curricula around Europe started to change including the eight Key Competencies for Lifelong Learning at their core, giving more importance to the learning of foreign languages and promoting bilingualism in schools.

The Key Competencies appeared as the main section of new laws of education as the *Ley Orgánica de Educación* (2006) in Spain. They supposed a paradigm shift in education as the main educational purpose of the curricula is not the memorization of contents anymore, but the development of the competencies. As Zabala (2007) explains, competence is the ability to solve tasks and to work efficiency in a particular context which forces the use of conceptual, procedural and attitudinal knowledge at the same time. Therefore, teaching only conceptual content and asking students to memorize cannot accomplish the main curriculum aims. In fact, several important institutions claim that schools should aim to the integral development of the human being, the respect to the diversity, the promotion of democratic values and intercultural perspectives, but this is not the reality in most of the schools (Zabala, 2007).

As we have learnt from the experts in education, to be competent involves the use of different skills that must be developed before. These skills cannot be acquired by listening and repeating, or any kind of simple memorization, as learning is a skill that

requires a lot of practice and training. The teaching of competences, thus, needs the use of other methodologies different from the traditional one.

This change is becoming an essential need in our system and all the experts in the educational field are claiming for a change. However, there is not a general agreement in which should be the main methodology for replacing the traditional one. We are definitely not going to say which should be the methodology to use in the schools. Nonetheless, providing the paramount importance of the eight key competences and the integral development of the students as human beings, we cannot but see a connection between that, the MI theory and the Content and Language Integrated Learning (CLIL).

Since Howard Gardner published his book *Frames of Mind: The Theory of Multiple Intelligences*(1983), the definition of intelligence has absolutely changed. Gardner defends that the intelligence does not refer to the capacity of solving problems by only using logical and linguistic skills, but using any of the eight skills he defines as “intelligences”. He explains that we have the potential to process the information for solving problems in at least eight different ways, using the following types of intelligences: linguistic, naturalistic, visual-spatial, bodily-kinesthetic, logical-mathematical, musical, interpersonal and intrapersonal.

If we compare the eight intelligences name by Gadner with the eight key competences we easily can see a connection. There are two competences related to languages and thus linguistic intelligence, one for mathematics and science that related to logical and naturalistic intelligences, one related to the interpersonal relationships and another one related to learning about the process of learning and thus oneself developing the intrapersonal intelligence. Furthermore, the methodology to teach the key competences must be always a global one (Zabala, 2007) and the application of MI theory implies the use of several intelligences in the learning process.

Due to the connection between these concepts, the application of the MI theory in the classrooms is more than fair. For this reason, some studies have been made about how to implement MI theory in the schools. However, there are very few researches focused on bilingual contexts, where CLIL is one of the most popular approaches, an approach that is focused on having active and independent learners who usually do not learn by listening and memorizing but by solving tasks and creating products.

Furthermore, even rather less attention has been paid to the study of how to teach learning strategies based on MI theory in a CLIL classroom, which is the focus of the present study.

1.2. BRIEF ANALYSIS OF THE STATE OF THE ART

MI theory stated that the intelligence is not an innate and constant feature along life. Gardner (1983), and later Armstrong (1994), explained that intelligence is developed according to the context and as long as the context changes along life, the intelligence does it too. This fact, together with the existence of at least 8 intelligences instead of a unique one claimed by Gardner, force to reflect on learning and teaching methodology.

As a result of this reflection many authors have studied how to apply MI theory in the schools, finding quite different ways of doing it. In this dissertation we present different ways of MI theory application by Richards & Rogers (2014), Luengo-Cervera (2010) and Armstrong (1994). Moreover, in order to understand how to apply MI theory, we need to know what the theory says and what proofs exist that support the veracity of the theory. For this aim, we have reviewed key studies on the topic written by authorities in the field such as Gardner (1983), Armstrong (1994) and Shearer (1996).

However, our study does not focus only on MI theory, it also refers to the learning styles described by Neuro Linguistic Programming (NLP) specialists and authors such as Díaz (2015) and Pritchard (2014). Not all people learn in the same way, everyone has a particular learning style and, as Díaz (2015) claimed, adapt the teaching to students' learning styles make learning easier.

Other important concepts in this dissertation are the learning strategies, actions taken by the students in order to facilitate their own learning. Beltrán (2003) wrote good definitions of strategies, that we have complemented with some examples of learning strategies given by Bentley (2010).

In addition, providing that we are working in a CLIL environment, we have reviewed CLIL literature from different authors. CLIL is an approach to teach content and language together (Coyle, Hood and Marsh 2010). The sessions and modules of this approach are designed according to the 4 Cs framework stated by Coyle in 1999, and explain by Meyer (2010). Finally, the approach works on different types of language proficiency, following Cummins (1999) differentiation between Basic Interpersonal Communicative Skills (BICS) and Cognitive Academic Language Proficiency.

1.3. OBJECTIVES

The aim of this dissertation is to design an intervention proposal to provide CLIL students, from a group of third cycle of primary education, with learning strategies based on MI theory. To accomplish this objective we need to:

- Analyse the utility of personalized learning strategies
- Examine the use of learning styles to create personalized learning strategies
- Understand multiple intelligences theory
- Investigate how multiple intelligences theory can be implemented in the CLIL classroom
- Explore how MI theory and learning styles can be connected
- Study how multiple intelligences and learning styles can help to create learning strategies
- Analyse learner's knowledge about MI and learning

1.4. METHODOLOGY

To accomplish our purposes, we review the literature about learning strategies, Multiple Intelligences theory, learning styles and CLIL approach, investigate how the MI theory can be applied in the classroom and particularly, in CLIL contexts.

Afterwards, we will have to analyse how the MI application can lead to the acquisition of learning strategies for students. The next step will be design a proposal for guiding CLIL learners to discover their MI profile, and how to use it to support their language and content learning. This proposal will be divided in four stages: a) an initial survey to discover what the students already know about MI and themselves, b) the teaching of Global warming through a CLIL unit based in the application of MI theory, and c) two specific lessons about MI, and d) a final survey to assess the success of our proposal.

Finally, we will reflect and discuss the proposal and talk about which should be the next steps.

2. LITERATURE REVIEW

In order to design our intervention proposal, we need to review the literature about learning strategies, MI theory, sensorial learning styles and CLIL approach. We will begin describing learning strategies, why it is an important concept for the school and how learning styles can be useful when selecting learning strategies. Secondly, we will

focus on MI theory and its implication for the educational field together with the explanation of the common points it has with the concept of sensorial learning styles. To complete the section, we will describe the main features of CLIL and how we can apply all the concepts in the CLIL context.

2.1. LEARNING STRATEGIES

In this section we are going to do a review the literature about learning strategies. We will start clarifying what learning strategies are and continue by explaining the consequences that they use have in the academic results to end describing how they can be selected according to different learning styles.

2.1.1. Definition of the concept

The concept of learning strategies has been quite controversial, having been defined in many different ways for several authors. In fact, despite being quite a popular concept, the experts still do not agree in what a strategy is (Beltrán, 2003).

One of the earliest definition was provided by Rubin (1975, p.75 quoted by Beltrán 2003) who says that strategies are “the techniques or devices which a learner may use to acquire knowledge”. Another definition related to language learning strategies explains them as particular actions that learners take to make learning easier, faster, more enjoyable, more self-directed, more effective and more transferable to other situations (Oxford 1990).

As we see, both definitions refer to conscious actions but Rubin understands strategies as techniques, a connection that has been criticized by many authors such as Beltrán (2003), who explains that we must distinguish between learning process, strategies and techniques. He defends that learning process refers to the group of activities implied in learning, which are almost invisible and not easy to manipulate whereas learning techniques are just the opposite. We always can see and consciously use learning techniques, such as making a summary or a scheme, but we cannot see mental operations like attention or comprehension.

Similarly, strategies such as the organization of data in order to understand content before an exam are more difficult to see than a technique such as summarize, but not impossible as the comprehension process that takes place in our brain (Beltrán, 2003). He also points out the difference in the mechanical use of learning techniques as opposite to the intentional act of designing a plan of action that learning strategies implied. For instance, once a student is working on understanding a piece of

information he/she can use a strategy to choose what information is the most relevant and use a technique for that purpose (Beltrán, 2003). Learning strategies and techniques, thus, are not the same but the use of learning strategies can push to the selection and use of different techniques.

We have talked about the definition of learning strategy and made clear that they are not techniques but both, techniques and strategies, must be used together. In the next section, we will explain why strategies are useful, understanding that the use of techniques is part of the act of using a learning strategy.

2.1.2. Learning strategies and academic results:

In spite of the lack of agreement in its definition, we can see that authors refer to learning strategies as actions done by students with the aim of improving learning. However, we cannot say that students always achieve their objectives as studies have shown that the relationship between strategies and proficiency is complicated (Griffiths & Oxford, 2014).

Some studies like the ones conveyed by experts such as Porte (1988) or Vann & Abraham (1990), quoted by Griffiths & Oxford (2014), showed that learners who did not achieve great marks were using a lot of strategies, although these strategies were not the most appropriate ones. Whereas many other researchers concluded that successful learners use a large number of learning strategies for different tasks (Bentley, 2010). And according to Beltrán (2003), learning quality and learning strategies are always correlated because the reasons for the different levels of achievement in students of the same age, course and characteristics can be found in the learning strategies they use.

Consequently, we can state that the promotion of good use of learning strategies can increase the number of successful learners. Teachers should help students to become aware of their learning process, teach their pupils learning strategies and how to select the most appropriate ones to suit their needs. Moreover, students need to construct their own group of learning strategies and for that, they need teachers promoting their use and giving learners time to practice them (Bentley, 2010).

It has been estimated that more than two hundred learning and thinking strategies exist (Hayes, 1985; quoted in Paterson & Rosbottom, 1995). We cannot list most of them here but we can see some samples for a bilingual context in Table 1, which shows the list of learning strategies that Bentley (2010) published for CLIL students. Furthermore, nowadays people receive and process visual and auditory information

constantly in newspaper, advertisements and radio broadcasters (Chau, 2006). Consequently, students of monolingual and bilingual classroom are receiving a great amount of information in the daily basis. Additionally, CLIL students need a lot of scaffolding and support on the language skills which sometimes increase the quantity of information they receive. For this reason, we consider important to describe some strategies that, according to this author, suit this situation such as:

- *Concept mapping* helps students to understand, organize and apply information by reducing it to the main ideas, and finding the connection between concepts.
- *Talking aloud, story-telling and narrative* helps learners to clarify their ideas as they have to organize, analyse and apply them in order to explain it verbally.

These strategies are useful for any learner but they can be even more helpful in the bilingual context. For instance, mind mapping supports the learning of foreign language concepts as it force the use of cognitive skills and facilitate the relation between concept and images. Talking aloud, story-telling and narrative also promote the pronunciation practice and improvement.

Table 1. Learning strategies for CLIL students

Learning strategies to be used...		
before doing a task:	during a task:	after a task:
<ul style="list-style-type: none"> -Selecting and setting learning goals -Deciding on criteria to measure how well a task can be done -Analyzing the task, its purpose and what has to be done -Working out timing of stages 	<ul style="list-style-type: none"> -Identify key content vocabulary -Predicting meanings of content vocabulary and predicting text content -Asking for clarification -Paraphrasing -Drafting work -Risk taking and experimenting with new concepts and language -Using some L1 for a specific purpose, e.g. checking the meaning of a concept. -Note taking -Organising work 	<ul style="list-style-type: none"> -Deciding how to remember new words and concepts -Making visual prompts to aid memory -Reviewing work alone or in small groups -Exchanging work with a partner and asking for feedback -Comparing work with previous work and deciding how it was improved -Editing work

Source: Adapted from Bentley (2010)

Now that we have learnt about the importance of promoting the use of learning strategies and the large amount of them that exist, we could start to wonder which strategies are the best for everyone. However, before we discuss this topic, we need to

understand that students do not learn exactly in the same way, as they have different learning styles.

2.1.3. Learning styles and academic results

In 1970s a new approach to communication and personal development appeared from the researches of Richard Bandler and John Grinder. This approach is known as Neuro-linguistic programming (NLP) and has become increasingly familiar in the educational world (Díaz, 2015). The NLP studies how communication affects learning and states the existence of three sensorial learning styles: visual, auditory and kinaesthetic (Pritchard, 2014).

It is undeniable that people can perceive world's stimulus by the different five senses, what NLP add is the existence of a preferred representational system that is shown in people conduct, communication and body-language (Díaz, 2015). In other words, everyone has a favourite sensorial channel that uses more often than the others which provokes differences in the daily actions.

One of the actions that are affected by the preferred representational system or learning styles is the learning process (Díaz, 2015). Considering that the learning process starts with the perception of a stimulus and people use different sensorial channels to perceive and process the information, we can state, in fact, that learning styles have a great influence in learning.

Regarding the characteristics that students show according to their learning styles Pritchard (2014) gives the following explanation:

Visual learners prefer to learn by seeing. They have good visual recall and prefer information to be presented visually; in the form of diagrams, graphs, maps, posters and displays for example. They often use hand movements when describing or recalling events or objects.

- *Auditory learners* prefer to learn by listening. They have good auditory memory and benefit from discussion, lectures, interviewing, hearing stories and audio tapes, for example. They like sequence, repetition and summary.
- *Kinaesthetic learners* prefer to learn by doing. They are good at recalling events and associate feelings or physical experiences with memory. They enjoy physical activity, field trips, manipulating objects and other practical, first-hand experience. They often find it difficult to keep still and need regular breaks.

Not only these characteristics but also investigations that took place at the end of the last century made clear that students learn in different ways to one another, and their execution in different subjects are related to the way they learn (Pritchard, 2014). If the teacher presents the information according to the pupil's learning style the student will feel more interested and will learn more easily (Díaz, 2015). Therefore, if we want our learners to use the most appropriate learning strategies and techniques they need to know which ones suit their learning style the best. For instance, when memorising content for an exam, a visual learner will benefit from mind maps with images while an auditory learner will memorize before verbal information from a record or a song.

It is clear that, detecting and using the particular strengths of learners to engage them in the class helps to improve the learning process (Gardner and Hatch 1990; cited by Pritchard, 2014). However, as Pritchard (2014) claims, these authors explain this process as the result of the MI theory. This fact shows that, as we will see in the following sections, learning styles and MI theory have many features in common.

2.2. MULTIPLE INTELLIGENCES

One of the most important concepts of this dissertation or maybe the most one is the concept of multiple intelligences and the theory that introduced it. As it is a controversial theory we will begin talking about the critiques against and in favour of the theory since its creation. Then, we will describe the theory and the concept of MI profile in order to understand its potential for the educational field. Finally, we will explain how MI theory and learning styles concepts are related to finish the section with some examples of how this theory can be applied in the bilingual classrooms.

2.2.1. Critiques against and in favour of MI theory

As already mentioned, in 1983 Howard Gardner, an American psychologist of Harvard university opened a big debate after stating that there was not one unique intelligence but many different. In his theory of Multiple intelligences (MI) he states the existence of at least 7 intelligences (he defends now the existence of 8 and possibly more) which means that most of the psychological test designed to measure intelligence were not useful. Consequently, this opened a huge discussion among psychologists.

Critiques arrived from many different professionals' perspectives like the politic, the psychological and the educational fields. Some experts still argue against this theory and opposite arguments are given such as that the theory is too flexible (because it includes art skills as proof of intelligence) or too rigid (because it defends that

everything should be taught by the use of different tasks), that it has not rules or that is has too many. In fact, Gardner has been accused of having based his theory in intuition as it has not been possible to create a test to identify and measure the different intelligences (Pérez & Beltrán, 2006).

Nevertheless, MI theory has got many supporters during these two decades. The author of *Frames of mind* (1983) did explain eight evidences of the existence of multiple intelligences in human beings, and Perez & Beltran (2006) pointed out that human brain studies support the existence of more than one intelligence. These evidences are also set up as criteria that any ability needs to meet in order to be considered a type of intelligence, and not a simple skill, talent or aptitude. The evidences have been explained by different authors (Perez & Beltrán, 2006; Macías, 2002; Armstrong, 1996). They are the following:

- *Potential isolation by brain damage.* After having worked with people who had suffered different situations that had affected their brains, Gardner realized that sometimes one intelligence was affected while the others were left in perfect conditions. An example of that is people who had a lot of difficulties for speaking but could still sing and dance.
- *The existence of savants, prodigies, and other exceptional individuals.* There are some people who demonstrate a high level ability in what can be described as one intelligence but a very low level in one or several others.
- *A distinctive developmental history and a definable set of experts “end-state” performances.* Considering that the development of the intelligences depends on the opportunities of the context, each intelligence has a developmental pattern, which means that it has a time for arising, a time for been in its highest level, and a time for declining.
- *An evolutionary history and evolutionary plausibility.* Each of the intelligences has been presented in the history of human beings evolution and even in the evolution of other species. For instance, we can see samples of spatial intelligence in the cave drawings and musical intelligence in the creation of the first's musical instruments.
- *Support from psychometric findings.* Despite been opposed to the use of psychometric test, Gardner suggested that many of them defend the existence of multiple intelligences as they required the use of more than one intelligences. A clear example of that is the popular Wechsler Intelligence Scale for children, which includes subtests that need linguistic, logical-mathematical, spatial and bodily-kinesthetic intelligence.

- *Support from experimental psychological tasks.* Studies have shown that people possess abilities in particular areas but cannot transfer them to others. For example, a person might recognize different musical sounds quite easily but not different verbal sounds.
- *An identifiable core operation or set of operations.* In order to solve any kind of problem or create a product, a set of operations, which is different in each intelligence, must be driven.
- *Susceptibility to encoding in a symbol system.* According to Gardner, symbolize is one of the capacities that separate human beings from other species and each of the eight intelligences possess its own symbol or notational system.

2.2.2. Definition of intelligence

Gardner did not only say that there was more than one intelligence but changed the definition of intelligence itself. He defined intelligence as the capacity to solve problems and create products in a particular and cultural context, being impossible to judge the abilities of a person by forcing him/her to, out of his/her learning context, do tasks that has never done before. Two main reflections have been done about this definition by Macías(2002):

- Solving problems relates to a mental operation that uses some strategies to solve a problem, which can be simple or complex; thus, both to sew a button to a dress and to find a vaccine for a mortal illness are considered problems that show intelligence in the people who solve them.
- The creation of a cultural product refers to products that are useful for a particular culture, which might not be needed in other context, as it would be useless to build a skyscraper in a small village where people live in houses.

Therefore, Gardner defends that intelligence is connected to the culture and the environment where a person grows and lives. Following his theory, people are not born more or less intelligent but develop some intelligences or others depending on the learning opportunities of the culture and context, and the decisions teachers, families and each person takes (Perez and Beltrán, 2006). For instance, a person born in India in a village where everyone practices meditation everyday would be good at solving problems about himself, about his/her emotions and feelings; whereas a person who grows up in any European country going everyday to schools where teachers focus on mathematics would more likely be good at solving mathematical problems.

Furthermore, the MI theory expounds that each person possess all intelligences having them developed to a different degree. Most of people develop a couple of intelligences to a high level, have a low competency in other two or three and a moderate one in the rest of them (Arsmstrong ,1994). In other words, each person has a unique MI profile. However, the MI profile can change along life as the intelligences' development depends on the opportunities people have to use them and most people can develop each intelligence to a satisfactory level (Armstrong, 1994). In fact, having a particular intelligence developed does not mean that a person is good at all kind of activities related to that intelligence. A person can be very good at telling stories and persuade people but not being able to read or write because they did not go to school.

It has been claimed that the intelligences work independently one from another, as autonomous abilities (Gardner, 1983). Each of them works with its own rules, procedures and systems having different biological basements (Macías, 2002). The development of one or two intelligences, thus, do not suppose the development of any other; which means that a person can be very good at solving a problem that requires mathematical operations but be quite bad at solving one that need the use of interpersonal skills. However, intelligences quite often work together in complicated ways (Arsmstrong,1994) as human beings usually need the combination of at least two intelligences to solve any problem. Anyone who wants to dance needs to have bodily-kinesthetic intelligence to move the body and musical intelligence to follow the rhythm.

2.2.3. MI profile

Armstrong explained in 1994 and repeat in the third edition of his book in 2009 that, as regards the measure of the intelligences and the definition of a personal MI profile, there is not any test that can measure the whole intelligence's spectrum. This statement is still valid as the intelligence's spectrum is quite wide and experts are still investigating it. Nevertheless, questionnaires have been designed in order to guide the observation of students' behaviour and even to be completed by the particular person who wants to know his/her MI profile (Beltrán & Pérez, 2006). It was Gardner himself (1983) who proposed observation as the best technique to evaluate people's intelligences and described the main characteristics of each intelligence to delimitate the focus of the observation. Later on, Armstrong (1994) created a MI checklist for students to guide teachers in their observation (Annex I).

The most popular and supported questionnaire is the *Multiple intelligences developments assessment scales* (MIDAS), designed by Shearer (1996). It differs from

other MI test in that it was designed to meet the principles of assessment that Gardner defended. Moreover, it has shown its validity and several classroom benefits.

Regarding the description of the eight intelligences, Gardner (1999) defined them as:

- *Musical intelligence*: The ability to understand the pitch, rhythm, and tone of music and to recreate or reproduce music by means of instruments or voice.
- *Bodily-kinesthetic intelligence*: The ability to use one's own body to create products and solve problems.
- *Logical-Mathematical intelligence*: The ability to develop equations and proofs, make calculations and solve abstract problems.
- *Spatial intelligence*: The ability to think in pictures, recognize and manipulate large-scale and fine-graded spatial images
- *Linguistic intelligence*: The ability to analyse information and create products involving oral and written language such as speeches, books and memos.
- *Interpersonal intelligence*: The ability to think and understand others, detecting and responding appropriately to the moods, motivations and desires.
- *Intrapersonal intelligence*: The ability to recognize and understand his or her own moods, desires and intentions.
- *Naturalist intelligence*: The ability to identify and distinguish among different types of plants, animals and weather formations of the natural world.

Other authors such as Suazo (2006) or Arsmstrong (1994) provide wider descriptions of the intelligences and more details of how the MI profile affects the students' way of thinking. For instance, learners with a strong linguistic intelligence love playing word games and telling stories and need stories, opportunities to discuss and tapes. A student highly bodily-kineasthetic loves dancing, jumping and gesturing and needs to be allowed to have tactile experiences, build things and do drama (Arsmstrong, 1994).

Therefore, the difference in abilities that people can show according to their MI profile is wide and so it is the operations used for solving a problem or creating a product. Schools ask students to solve problems in daily basis and give them grades by assessing how they solve those problems. MI profile, thus, affects the academic results and MI theory should be taking into account in monolingual and bilingual classrooms similarly to what happens with learning styles.

2.2.4. Common points of MI and learning styles

After reviewing the literature about learning styles and MI theory it is easy to understand why some authors (such as Pritchard, 2014) said that there are overlaps between both theories. Both theories defend that students do not learn the same way one to another and that teacher should keep in mind these differences when programming the lessons and assessing their pupils.

Furthermore, Luengo-Cervera (2015, p.85) offers a list of the characteristics that the two concepts shared: (1) They refer to individual differences regarding learning preferences; (2) they are possessed by all, though in different proportions; (3) they are not innate, and can be stretched; (4) the values are neutral, neither positive nor negative; and (5) they are stimulated within a specific environment or cultural setting.

The main aspects of MI theory and learning styles thus, are quite the same and both concepts have a strong influence in academic results. They are two theories that must be addressed in the schools if we want to let learners achieve all their potential (Reid, 1987; cited by Luengo-Cervera, 2015).

Moreover, there are some intelligences that share a lot of characteristics with the learning styles and should therefore, be considered together in the classroom (Chau, 2006). These intelligences are: the visual-spatial, the linguistic and the bodily-kinaesthetic ones. As Chau (2006) claims, if we review the definition of these intelligences and the learning styles we will see that:

- Learners with a strong *Visual-spatial intelligence* and students whose learning style is *visual*, can think in pictures as they are visually orientated and are able to think abstractedly.
- Learners highly *linguistic* and *auditory* students remember more easily what they hear and like activities in which written or oral language is involved.
- *Kinesthetic* students and learners who are highly *bodily-kinesthetic* benefit from activities that allow them to use the body.

Providing that both theories defend that students learn better if the information is provided according to their preferences, teachers should know both and take them into account. The application of both theories in the classroom can be done in different ways according to the context and the objective followed by the teacher. For instance, teaching and learning following a traditional methodology differs quite a lot from doing it with CLIL approach, and learning through a foreign or a second language is not the

same as learning through the mother tongue. We will see some examples of how to implement the theories in the following sections.

2.2.5. MI theory application in the classroom

There is not a general model that can be followed in the classroom to apply MI theory (Suarez, Maíz & Meza, 2010). However, it is undeniable that traditional teaching methods do not take into account the MI theory, as it only works on linguistic and logical-mathematical intelligences.

Furthermore, in the traditional classrooms, teachers are the centre of the lessons and students are considered passive learners, whereas Gardner defends that lessons should be student-centred and give students autonomy in their learning (Suarez et al., 2010). According to this theory, learners need to be involved, active in their learning process.

Moreover, pupils' interests, preferences, abilities and needs are often forgotten in most of schools while MI theory states that they must be the guides for the selection of learning materials (Armstrong, 1994 As Suarez et al. (2010) claim, schools need to understand students in order to promote a good development of their cognitive profile.

Content can be taught through a wide diversity of activities and through different formats. Traditionally, schools provide content by explanations and activities that only work on linguistic and logical-mathematical intelligences. Nevertheless, there are many other ways to provide information and support students' content learning and it can be done in an absolutely more effective way if we based them in learners' strengths and abilities (Suarez et al., 2010). A way to do that is by changing the methods used for the presentation of content; for example, presenting the content one day verbally, other day in a visual support and other through an activity that implies movement (Armstrong, 1994). This shift is quite similar to the ones teachers can do when trying to take learning styles into account, as they provide information through different sensorial channels. Therefore, this technique is useful for the application of both theories.

Not only can the presentation of contents change, but also the activities done in the classroom and the design of the lessons. In fact, using any student-centred approach as Gardner recommended, learners have the opportunity to make decisions such as choosing what activities to do, which materials use for an activity or the content format. Additionally, teachers can design lessons and even whole units using activities in which different intelligences are needed and learners with different learning styles are benefit. Some authors have made lists of academic activities that work on each of the eight

lessons. In Table 2, we present a mixed of the activities explained by Luengo-Cervera (2015), Richard & Rodgers (2014) and the ones introduced by Suarez et al. (2010).

Table 2. Classroom activities for each intelligence.

Intelligence	Activities
Linguistic	<ul style="list-style-type: none"> Listening to lectures, CDs and stories and, discussing in groups. Doing debates, exhibitions, dialogues, word games, story-telling. Memorizing linguistic facts and using word processors. Reading and writing cards, stories, journals, magazines, diaries,
Logical-Mathematic	<ul style="list-style-type: none"> Ordering the sequences of a story, predicting the cause and effect of facts and classifying and categorizing information. Solving logical, story problems, puzzles and computer problems. Using critical and science thinking and creating codes. Using or creating images, pictures, diagrams, maps, slides, posters, collages and videos using different colours and drawing.
Visual-spatial	<ul style="list-style-type: none"> Using telescopes and microscopes. Taking pictures and doing visual awareness activities such as visual puzzles and look for differences in pictures. Relating images and meaning as creating metaphoric relationships and thinking visually. Organizing information visually in graphic organizers. Listening/singing/playing music, following and creating rhythms, verbal/non-verbal sounds, melodies and instruments.
Musical	<ul style="list-style-type: none"> Singing a story and singing didactic songs. Looking for patterns in intonation and sound and memorizing them Creating instruments and doing jazz chants.
Body-Kinesthetic	<ul style="list-style-type: none"> Doing total Physical Response games, creative movement, hands on activities, and handicrafts. Doing sport, physical games, drama, mime, and role-plays. Using tactile materials, virtual reality software and kinaesthetic pictures, cooking and dancing.
Interpersonal	<ul style="list-style-type: none"> Using cooperative work, pair teaching, games in pairs and groups as board games, doing simulations of conflicts and mediations. Doing group brainstorming, interviews, drama and projects with the community in which students have to communicate.
Intrapersonal	<ul style="list-style-type: none"> Doing independent work as writing a journal and reflective writing. Doing self-esteem games, self-teaching instruction, inventories and checklists, individualized projects, session of relaxation, visualization and goal setting.
Naturalist	<ul style="list-style-type: none"> Observing, describing, and classifying: animals, environment, plants, weather and natural medicine and doing experiments. Watching natural life in videos or field trips such as aquariums and zoos, working on a garden or plants in the classroom, use music and natural sounds.

Although there is not a syllabus or model, the application of MI theory has been done in many contexts providing examples of how it can be done. For instance, classroom can be divided in different corners, each one built to work on a different intelligence, being the students allowed to work on the corner they want (Richards & Rodgers, 2014). These corners are called sometimes “MI stations” and can be used to work on a unit or on a project, allowing students to learn by using the intelligence of their preference, or

forcing them to use all intelligences and sensorial channels by having to do some activities in each station.

Another way to include the MI in the classroom is through Project based learning. Nicholson-Nelson (1988) (cited by Richards & Rodgers, 2014) claims that projects can be planned around MI theory to individualize learning in five different ways:

- *MI projects* are projects designed to stimulate one or several intelligences.
- *Curriculum-based projects* are projects designed to work on curriculum content areas through a particular intelligences.
- *Thematic-based projects* use different intelligences to work on a theme from the curriculum or classroom.
- *Resource-based projects* make learners investigate a topic through the use of the different intelligences.
- *Student-choice projects* are projects decided by learners built around a particular intelligence.

Using project-based learning (PBL) teachers can work on MI theory in different ways as we can see. Lessons can be built around a particular intelligence or around all of them, providing students with the same opportunities regardless their learning style and MI profile. Even though PBL suits MI theory application we have seen the intelligences can also be taking into account by using a combination of activities in the classroom. There are, thus, a large variety of ways to apply MI theory that can be adapted to the educational approach of the school. In the following section we will talk about a new approach to bilingual education in which MI theory and PBL are often included.

2.3. HOW TO APPLY MI THEORY, LEARNING STYLES, AND LEARNING STRATEGIES IN A CLIL CONTEXT

Before we focus on the application of MI theory and learning strategies in the CLIL classroom we should have a clear idea of what implies to follow a CLIL approach. Then, we will analyse how to use both theories for the creation of strategies for CLIL learners.

2.3.1 CLIL approach for bilingual contexts

Bilingual education has been working in Europe for several decades. As the publication of Eurydice (2006) explains, some countries and regions where a minority language coexisted with the official language, introduced the minority one into schools as vehicular language of some subjects to enable students to be equally proficient in both

languages. However, it was not until the 1970s and 1980s when bilingualism in schools started to spread across Europe due to the successful of the Canadian experiment with immersion programs in schools (Eurydice 2006).

The immersion program in Canada was a dual-focused approach in which a second language was used for teaching and learning content. The successful of this content-based instruction (CBI) approach promoted investigations in the area, looking for suitable adaptations to implement a similar program in Europe (Eurydice, 2006). Researches and adaptations that resulted in the creation of Content and language integrated learning approach, most popular known by the acronym CLIL.

According to Coyle, Hood and Marsh (2010), CLIL is an umbrella term that refers to educational activities that use an additional language as vehicle for teaching and learning a non-linguistic subject. Even though the definitions of CBI and CLIL are quite similar, CLIL differs from others approaches in that it gives the same importance to the learning of content and language, specifying language objectives in content subjects. Moreover, CLIL often involves a non-native teacher in the classroom who is usually a content specialist but will have to teach language too while in Canada there usually are a content specialist and a native language specialist in the classroom (Dalton-Puffer, 2008). In CLIL classroom thus, the challenge is bigger as one teacher must teach and assess both language and content.

Another main characteristic of CLIL is the 4Cs-framework designed by Do Coyle. This framework, as Meyer (2010) explains, facilitates CLIL lessons planning and CLIL materials design. It is based on the following principles:

- Content: Content matter is about the students creating their own knowledge and understanding and developing skills;
- Cognition: Content is also related to learning and thinking, and both must be analysed for their linguistic demands in order to have students creating their own interpretation of content;
- Communication: language needs to be transparent and accessible, students must learn the language by the interaction in the context and teachers should promote the learning of the language of communication (language related to a specific content of a subject) language for communication (language needed to interact with classmates and teachers) and language through (language they use to explain and their learning in their own words, transferable to other languages)

- Culture: Intercultural awareness is essential in CLIL environment but culture is also understood as citizen conducts, global awareness and values.

In a CLIL classroom thus, teaching and assessment must include content, critical thinking skills (to work on cognition), foreign language (for communication), and intercultural and civic competence. In order to work on all these aspects, CLIL learners need to participate, discuss and justify their ideas in the classroom (Coyle et al. (2010).

As regards to the learning of the additional language, CLIL lessons planning includes two section based on Jim Cummins (1979, cited by Cummins, 1999) suggestion about the existence of more than a dimension of language proficiency. He explained that a 6 years old child does not have the same ability that a 12 years old to use rich vocabulary, write and read in their mother tongue but does have very similar fluency and phonology competence. Therefore, people can have good language proficiency for interacting with others in a daily basis but not have the same language command to communicate properly in an academic environment.

Furthermore, studies have demonstrated that immigrant children can often communicate properly with other children after two years in the foreign country but need around 5 to acquire a good level in academic writing (Cummins, 1999). Consequently, in CLIL bilingual contexts teachers need to help learners develop two types of language: Basic Interpersonal Communication Skills (BICS) and Cognitive Academic Language Proficiency (CALPS). This must be showed in the lessons planning where they also can be named as “language for communication” (BICS) and “language of communication” (CALPS). Additionally, CLIL plans includes another language dimension named “language through” that refers to the language needed in the mental process for the learning of contents (Coyle et al. 2010).

Regarding the role of teachers and learners, CLIL is a student-centred approach where teachers are guides for students’ learning. Students are supposed to be independent learners, developing the learning to learn competence while the teachers scaffold the content and provide support when needed. For this reason, task-based approach and project-based learning are usually present in CLIL contexts, giving students the opportunity of making decisions and work cooperatively.

In conclusion, CLIL approach refers to the teaching of content matters through a foreign language with the aim of teaching content and language at the same time. Although there are different ways to do CLIL in a classroom it always should involve the work in cognitive skills and intercultural competence while promoting autonomous

learning. Considering a particular context as it is a CLIL environment, in the last part of this section we will reflect on how MI theory and learning strategies can be applied to support CLIL students' learning.

2.3.2 Application of the theories: MI theory, learning styles and learning strategies in the CLIL context

Once we have learnt about MI theory and how many features share with learning styles we can understand that both ideas have a great influence in academic results. Moreover, we have seen that these theories can be applied in schools in a lot of ways.

An example of MI application is the teaching strategies built around each of the intelligences that Armstrong explains (1994). Providing that all pupils have different MI profiles and thus, not all of them will benefit from the same teaching strategies, teachers should use a large number of them (Arsmstrong, 1994). In the same way, no all students will benefit from the same learning strategies, some strategies will be more appropriate for learners highly linguistic and others for highly visual learners. In the following paragraphs, we want to present some learning strategies that can be appropriate for each of the intelligences based on Armstrong's teaching strategies (1994) and Chau (2006). These strategies are useful for any educational context but they have even a bigger potential in CLIL classrooms.

- *Strategies for linguistic intelligence:* create stories to remember the content, write a journal page summarizing the main points of the content, read the content aloud, listen to records about the topic (if the textbook have CDs use them, if not, look for videos in YouTube that talk about the topic).
- *Strategies for logical-mathematical intelligence:* make schemes, lists, time lines, Venn diagrams and mind maps organizing the information in categories and/or logical sequence, looking for cause-effect and other types of relations.
- *Strategies for visual-spatial intelligence:* visualize the contents (close their eyes and try to image pictures of what they are learning), use colours on the notes used for studying to emphasize important facts or concepts and to classify information, underline the main ideas and make a draw of them.
- *Strategies for bodily-kinesthetic intelligence:* dramatize the content as an actor of theatre or as a mime and pantomime the main concepts.
- *Strategies for musical intelligence:* find a melody or rhythmic format to sing or rap the content, create a song or rap with the main concepts, listen to music that talks about the content and use instrumental music to get relaxed.

- Strategies for *interpersonal intelligence*: study with one or more friends that you can discuss the content with and solve doubts, make a simulation or drama with peers with the content or main concepts.
- Strategies for *intrapersonal intelligence*: stay in silent for a minute after having read a part of the content to think about what you have read, think about the relation between the content and your real life reflect on your feelings before and after studying and set goals for organizing your study.
- Strategies for *naturalist intelligence*: look for the natural organisms, plants or animals you are studying about (in pictures if not possible to see them in real life), do experiments when possible to see the real effects of what you study.

In conclusion, there are too many learning strategies to be able to teach all of them but there are two important theories that explain that not all strategies are appropriate for all students. Pupils have different learning styles and MI profiles which makes some strategies more appropriate for some learners than for others. Furthermore, the needs of students who learn through a foreign language as it happens in CLIL classrooms are not the same as the monolingual learners' needs. Providing these facts, we have design our intervention proposal that is explained in the following section.

3. INTERVENTION PROPOSAL

Our intervention proposal consists in the application of our findings during the literature review. It is divided in 6 subsections in which we have applied different aspects of MI theory, CLIL approach as the classroom methodology and the teaching of learning strategies based on MI profile and sensorial learning styles.

It starts with description of the target group, the aims of the proposal, and the methodology to be use during the intervention. Then we explain the steps to be followed in our intervention, which is divided in 4 main stages although the explanation of them is distributed in only three subsections. Therefore, the fourth section describes two different stages of the intervention, the two stages in which questionnaires will be used. Consequently, that section includes the justification of the questionnaires design, their validation and the illustration of how to distribute them at the beginning and at the end of the intervention.

After talking about the questionnaires we describe the second stage of our intervention which consists in a CLIL module designed from the MI theory perspective, presenting

the academic objectives, methodology, timing, activities of each lesson and how to assess students' learning.

To conclude the intervention proposal, we explain how to teach students about MI theory and learning strategies in two lessons.

3.1. TARGET GROUP

This proposal has been designed for any classroom of 5º or 6º grade of Primary in a bilingual school. As this is not for a particular group, the context details are not very specific.

The school where it could be implemented would be not just a bilingual school but one that follows CLIL approach. Therefore, learner's level of English should be closed to the A2, receptive comprehension skills should be high and learners should receive at least two content subjects through English. Ideally, learners studying Natural and Social Science through English; if this does not happen, they must have studied Natural Science through English in some previous year. The proposal has been designed for classroom of 20 to 25 learners.

3.2. OBJECTIVES

The main objective of this proposal is to provide students with learning strategies to improve their academic results in a CLIL context taking into account their MI profile.

In order to achieve this objective we designed the following specific ones:

- Analyze CLIL learners knowledge about intelligence, learning and MI
- Investigate CLIL learners awareness of their learning process
- Provide CLIL students with the opportunity to use different intelligences to learn language and content by implementing a CLIL unit planning from MI theory perspective
- Make CLIL learners aware of the existence of MI and give them the opportunity to know what their strongest intelligences are.
- Evaluate the intention of change of students' behaviours when studying a CLIL subject by using learning strategies related to their strongest intelligences through a final questionnaire.

3.3. METHODOLOGY OF THE PROPOSAL

This is a complex proposal as it is divided in 4 stages and one of them takes place in two different moments of the implementation: one to evaluate the situation before the intervention and another one to assess the results of our proposal.

In the first stage, students must complete a questionnaire in order to collect information about learners' preferences and knowledge about intelligence and learning.

After that, a complete CLIL unit designed to work all intelligences will be implemented. This unit works contents from the Spanish curriculum for the last cycle of primary education. Therefore, it could be implemented in any CLIL school with the purpose of teaching content and language; however, it is of special interest for our educational proposal, as a way to prepare students for learning about MI and understand how helpful learning strategies based on MI can be. The application of MI theory will be done through the settlement of MI stations or corners in the classroom, which will be explained in more detail in the CLIL module section.

The third part of the proposal consists of a two-hour lesson about MI theory and how to apply them for learning strategies. The teacher will use figures as the tools to help learners understand what the MI theory defends and how they can select learning strategies based on their MI profiles.

These lessons about MI theory, need to be assessed, as we need to know the results of the implementation of our proposal. For that reason, we designed a final survey that is connected to the first one to see what students have learnt during the intervention.

For a better understanding of the intervention structure, we have designed Figure 1 as a summary of the intervention proposal. The figure summarizes the tools that will be used during the intervention, the main purposes of the intervention and the stages of it.

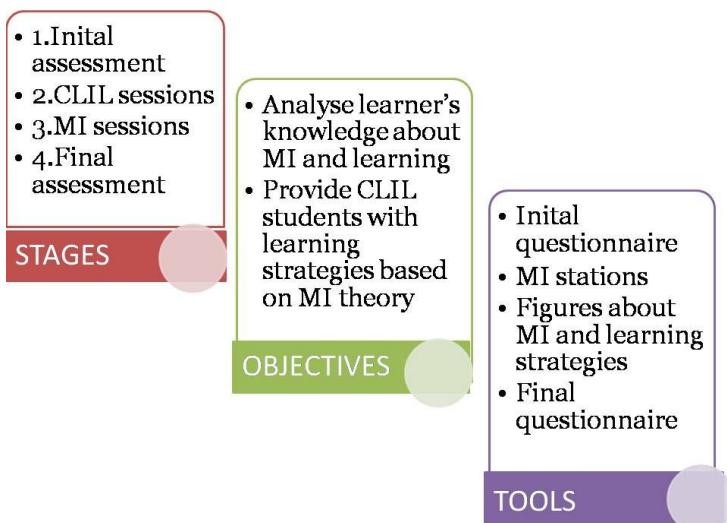


Figure 1. Intervention proposal structure

3.4. INITIAL AND FINAL QUESTIONNAIRES

3.4.1. Design and validation

Before teaching new content, teachers must activate previous knowledge in their learners and explore what they already know in order to make sure students are ready to learn the new topic. Teachers have to adapt their lesson plans according to the knowledge students have about the topic, as lessons cannot be too difficult for learners but always a bit challenging. The same way that they need to assess at the end of the lessons and unit what students learned.

The same happens with a proposal like this one. Before we start working on MI theory and learning strategies, we need to discover what they already know. Moreover, as we are studying MI to develop learning strategies, we believe it is important to collect some information about learners MI profile. Although we cannot do a perfect MI profile of the students due to the lack of time to do the MIDAS Test, we can get a good idea of what their strongest and weakest intelligences are at that moment.

In order to get this information, we will ask the teacher complete the “*MI checklist for students*”, by Arsmtrong (1994), as already introduced in the literature review (and is attached in annex I), and will ask the students to respond an initial questionnaire that we have designed (Annex II). We consider important to have students complete the questionnaire because, as Armstrong (1994) defended, they have to live with their intelligences all the time and thus, now a lot about them.

Furthermore, providing that English is a foreign language for the learners and they always can misunderstand part of the messages, we decided to write the questionnaires in Spanish. It is absolutely necessary that students understand all questions and answers in order to have valid results and their level of English is not important for our study. Therefore, the professional who delivers the surveys should explain it in Spanish and reply any question students might have.

The initial questionnaire we have designed to be completed by the students is divided in three sections. The first and the second section (section A and B, questions from 1 to 5) are aimed to get an idea of the students' MI profile, their sensorial learning styles and the use they do of their intelligences in the CLIL context. We have separated them in two sections as the questions of section A refers to learning to learn competency, in other words self-awareness, and the section B only asks for preferences. In the first question pupils have to select from three options which sensorial channel they prefer to use for learning natural science through English while in question two, three and five they have to mark different options related to the intelligences they prefer to use when working on academic activities. The fourth question asks learners which is their favourite subject as students usually like subjects related to their strongest intelligences. However, the last section (C) aims to discover what learners know and think about learning and intelligence, and the effects that intelligence might have in the academic marks in CLIL subjects.

For designing the first two sections questions, we took some ideas from Armstrong's MI checklist for students (see Annex I) adapting them in order to make them easier for children of this age. Whereas for designing the third part of the survey (C) we took into account usual misconceptions about intelligence and contents that are worked in Natural Science CLIL classrooms.

As we can see in Table 3, the questionnaire is formed of only 7 questions, we decided not to add more questions in order to avoid tiredness when completing it. We must be aware that it has been designed for eleven-twelve years old and we need them to be focused to complete it. Learners could lose their concentration and motivation to complete the questionnaire if it were too long, and answer without having read all the options. We need to make sure their answers are as closer as possible to the reality, taking into account that children of that age are still learning about themselves.

Table 3. Initial questionnaire matrix.

	DIMENSION	QUESTION	TYPE OF QUESTION
MI profile	A.Self-awareness	1. Recuerdas mejor aquello que...	Unique answer
		2. Las actividades más fáciles para ti son en las que tienes que...	Multiple choice
		3. Cuando tienes que estudiar “Natural Science” en inglés...	Scale
	B.Preferences	4.De las asignaturas que estudas en inglés, tu asignatura favorita es	Unique answer
		5.Teniendo que escribir y hablar en inglés prefieres las actividades en las que tienes que...	Unique answer
	C.Intelligence and learning	6.En las asignaturas que se estudian en lengua inglesa, todo el mundo aprende nuevas...	Scale
		7. En las asignaturas que estudia en lengua inglesa una persona muy inteligente...	Scale

Regarding the final questionnaire (Annex III), that they will complete after the CLIL module and the two sessions about MI theory, there are other three main sections named A, B and C again. Table 4 shows the matrix of this questionnaire.

Table 4. Final questionnaire matrix

DIMENSIONS	QUESTIONS	TYPE OF QUESTIONS
A.MI Profile	1.Durante el tema sobre la contaminación y el cambio climático que estudiaste en inglés, aprendiste más en las actividades en que...	Multiple choice
	2.En la asignatura de “Natural Science” que estudias en inglés crees que aprendes más en actividades en las que tienes que...	Multiple choice
B.Learning strategies	3.La próxima vez que tengas que estudiar para “Natural Science”...	Scale
C. Intelligence and Learning	4.Una persona inteligente en la asignatura de” Natural Science” en inglés	Unique answer
	5.Si las inteligencias más fuertes de un/a estudiante son...	Unique answer
	6. En la asignatura de “Natural Science” en inglés todo el mundo aprende más fácilmente...	Unique answer

The two questions of section A will push pupils to think about their own process of learning during the unit. This way they will have to use their intrapersonal intelligence and provide information once again about their MI profile. The results of this section will help us to assess whether the stations (corners of the classroom where students will learn by using different intelligences) will have worked properly as students should have learnt more from the stations in which they had to use their strongest intelligences.

The second section consists only in one question, number three. This question could be included in section C as it also refers to learning and intelligence. However, this is the only question that will help us to evaluate if our proposal have achieved its main objective: help students to select learning strategies according to their MI profile.

As regards as the last three questions, they are part of the section C and assess what students have learnt about MI and learning strategies. Questions number 4 and 6 focus on the misconceptions people usually have about intelligence and learning (so we can see the difference from the initial questionnaire) and the number 5 evaluates if students have understood which learning strategies are suitable for different people with different MI profile (check the intelligence the corresponds to each option in the questions in Annex V).

The questionnaires must be validated in terms of validity, clarity and relevance. In other words, they must focus and serve for the purposes we follow and not for others, the items must be clear so people can understand them and have more or less the same results if it is used in a different context. To assure this, a group of three experts will assess our surveys using the evaluation sheet (Annex VI) and with the support of the questionnaires matrix (Tables 3 and 4), and the table that specifies what intelligence each question refers to (Annex V). The evaluation sheet shows a table with space for grading each of the questions and write comments about them in case there is something that could be improved.

Providing that MI theory is from the field of psychology but is being applied in schools, we consider important to have our questionnaires checked by experts of both, education and psychology. Consequently, the experts that assess our questionnaires should be professionals of MI, CLIL and primary education.

3.4.2. Distribution of the questionnaires

The initial and final survey can be given to the learners by a teacher or any another professional of education. Ideally, the person will be someone learners know and feel comfortable with.

The teacher or professional to give the surveys will explain that students have to complete the survey individually and in silence. That person can read allowed the title of each activity and ask learners if they understand them and make sure children will not doubt in asking any question they might have while completing the survey.

It is essential that each child does his/her own survey and does not take into account others opinion, as we want to get an idea of his/her real preferences and thoughts. Because of that, the professional must be careful and not give any example that can influence students of that classroom when answering the questions.

3.4.3 Data analysis: procedure

In order to help to check the results of the initial and the final questionnaires and make an idea of learners' MI profile, teachers need to understand what intelligence or learning style each option of the questionnaires refers. For this reason we have designed a matrix (Annex V) where we specify with an initial the intelligence that the question refers to. We chose the following initials: "L" for Linguistic intelligence, "N" for Naturalistic, "MU" for Musical, "V" for spational-visual, "Bk" for Bodily-Kinesthetic, "LM" for Logical-Mathematical, "IA" for Intrapersonal and "IE" for Interpersonal intelligence. Understanding that students who have a strong spatial-visual intelligence will benefit from the same learning strategies that one with a visual learning style, we chose "V" for visual learning style too. Considering that the learning strategies that are suitable for students with and auditory learning style are also suitable for learners with a strong linguistic intelligence with use "L" for auditory learning style too. For the same reason, we selected "BK" for Kinaesthetic style. This way, the question that refers to the use of sensorial channels still helps us to define students' MI profile.

For facilitating the analysis of the results, we have designed a "questionnaire result's sheet" (annex IV) in which the results of the two questionnaires completed by the students and the MI checklist completed by teacher will be summarized and compared. Once teachers have checked the result of questions from 1 to 5 of the initial questionnaire and the student's MI checklist completed by the teacher, they will have learnt everything they could about learners' MI profile. However, there are still two

questions more to check in the first questionnaire. The answer to the questions of the section C will only tell us if students know that a person can be intelligent in different ways and people do not learn the same way or they do not know that. We need to compare the answers of these questions with the answers to the section C of the final questionnaire once it has been completed, in order to assess the successful of our intervention proposal.

Similarly, once learners complete the final questionnaire, comparing the results of the section A questions with their learning profiles will tell us whether students learned more from the stations in which they used their strongest intelligences. Providing that MI theory defends that people learns better when using the intelligences that have developed the most, the result of section A should be similar in both questionnaires.

3.5. DESIGN OF THE CLIL SESSIONS

3.5.1. Objectives

The present CLIL module aims to provide students with the opportunity to use all their intelligences while working on a curricular topic. To achieve this, learners will work on the topic of Global warming and the language needed for discussing this matter.

As we are working on curricular content in a CLIL environment, the module has been designed to achieve some content and language objectives. The content objectives have been listed following Blooms's Taxonomy from the ones that refer to the lowest order skills, to the objectives that work on higher order skills. Similarly, the language objectives have been divided in language for, language of and language through ,as you can see in the following list:

Content objectives:

- Describe the Greenhouse effect
- Name the Greenhouse gases
- Understand the causes and the risks of Global warming
- Understand human being will not be able to survive if we do not stop damaging the planet Earth.
- Explain some actions humans beings should do in order to reduce pollution and Greenhouse effect
- Understand and describe the own feelings about the Global warming and the work in stations
- Do an experiment about Greenhouse effect

- Contrast the results of an experiment with prior knowledge of Greenhouse effect and the initial hypothesis
- Organize Greenhouse effect and Global warming information in a mind map
- Self-assess the own work grading it from 1 to 4 and explain what should be improved in future works
- Reflect on and write about the learning process comparing what they knew with what they learn about Global warming

Language objectives:

Language of:

- Understand, know and use orally and in the written medium lexicon and expressions related to Global warming. Examples: Carbon dioxide, CO₂, Methane, Nitrous oxide, Greenhouse effect, deforestation, layer, Global warming, reduce, reuse and recycle, radiation, carbon footprint, fossil fuels...
- Read texts connected to Global warming
- Listen to songs that talk against pollution
- Listen to explanations about Climate change
- Use modal verbs to express the need of reducing pollution in the Earth
- Use future and conditional tenses for the expression of cause/effects regarding pollution and Global warming

Language for:

- Ask and answer questions about the topic to the teacher and peers
- Ask and answer questions about the activities to the teacher and to the peers
- Express agreement and disagreement
- Express hypothesis
- Write reflections at the portfolio

Language through:

- Present orally the advertisement
- Write about what you have learnt in the diary

3.5.2. Methodology

The unit we propose to teach has the following characteristics:

Subject: Natural science

Topic: Global warming

Level of English: A2

Number of lessons: fifteen

Technique use: multiple intelligences stations

Final product: an advertisement to make people aware of Global warming

This unit must be worked from the MI intelligences perspective and from CLIL approach at the same time. This means that learners must be active in their learning and the centre of the classroom. The teacher thus, cannot have the traditional role of transmitting content by explaining or reading it. He/she must be only a guide, a person who introduces the topic to the students and the different activities they will have to do, and then, be there to solve doubts and give feedback. Moreover, the teacher will prepare the classroom before the lessons, preparing activities that work on different intelligences and distributing the activities and materials in corners that are called “MI stations” and must be settled in the class. Students must work on their own in the different stations go to the teacher only to ask for materials and help when they do not understand something after having thought about it during a while.

During the first two weeks, learners will be gathered in groups of four but will work individually in most of the stations (except for the interpersonal and bodily-kinesthetic one) as working the interpersonal skills is not an objective of those stations and we want all pupils to use their MI with the same intensity. Even though working in groups would have a lot of benefits, it would also involve having some discussions arguments between learners and spend more time at the same station. Moreover, if students are not used to cooperate when working on a project or task, some of them might do all the work while others do not work at all, and we need all students having the same opportunities to work on each of the intelligences.

Teachers must be aware that there will be 3 stations working at the same time, thus, there will be one or two groups of students in each station every day. All groups must have worked in every station at the end of the week but they are supposed to choose which station they start with having the teacher working as a mediator in conflicts but not making the decisions straight away.

Once the pupils have worked on the visual, musical, naturalist, mathematical, linguistic, interpersonal and bodily-kinesthetic intelligences, they will work in the intrapersonal one. During one session all students will be sitting down and work individually reflecting about their learning and feelings in those days. The teacher will

have the same role as before although he must keep the learners in silent in order to allow them to think and reflect properly.

After the session built around intrapersonal intelligence pupils will work in groups in the creation of an advertisement. All the details are explained in the section for the activity but it is important to remember that the teacher will be again only a guide although he/she will assess the scripts and the advertisement exhibitions (in the last sessions of the module).

Regarding the design of the activities it has been done taking into account MI but also according to CLIL approach which means that not only content, but cognition, communication and culture must be worked. Learners are asked to use their critical thinking skills in different moments of the unit such as: creating a mind map, writing a slogan and a script for an advertisement and formulating a hypothesis before doing an experiment.

Communication refers in CLIL to the use and learning of a foreign language that in this case in English, language that must be used for everyone in the classroom during the whole unit. The teacher can support some explanations with the use of learners' mother tongue but it should be avoided while possible. They can use other types of scaffolding as gestures, pictures, mime, drawings on the board and use of dictionaries. Moreover, all the materials are in English and must be completed in the same language to make sure students work on the four language skills.

Culture is one of the main aspects of this unit as the topic (Global warming) affects all human being and the activities have been designed to make learners aware of the risks that this situation has for the whole humanity. Furthermore, pupils will have to work in groups in the station built around the bodily-kinesthetic intelligence and to create the advertisement which is the final product of the module.

Figure 2 represents how the 4 Cs will be worked during the CLIL module in a more summarized way.

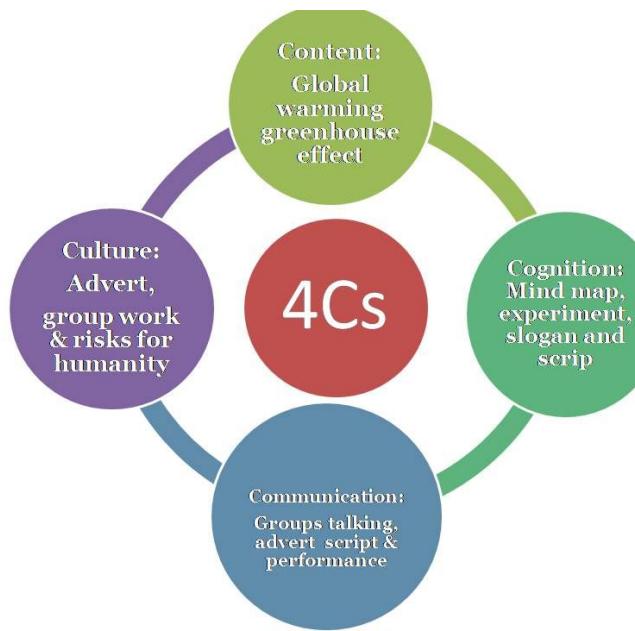


Figure 2.The 4 Cs in the CLIL sessions.

3.5.3. Timing and planning

At the beginning of any CLIL unit, teachers have to present the content and activate learners' prior knowledge. Advance organizers are likely the most common tool for activating prior knowledge and can last from 5 to 30 minutes as it depends on how much students know about the topic and how much the teacher allow them to talk. We thus, cannot say exactly how long it will take to present the topic and have decided to let a whole hour for activating prior knowledge, introducing the new topic and explaining what the method to follow during the CLIL module.

All the seasons are designed for working on one station in a unique activity that last around 50 minutes. However, some learners might need a bit more time to complete some of the activities of the second week stations, and the teacher should be flexible as long as it is possible. The same happen with the time dedicated to the advertisement, depending how often students work cooperatively in groups and do similar activities to the creation of an advert, 5 hours will be too much time or not enough. The teacher should provide support to the learners and remind them that it should be finished in 5 lessons but also be comprehensible with them if they finish early or ask for a bit more time.

Considering that the proposal needs around 16 hours of work and in most of schools 3 or 4 hours a week are dedicated to the study of Natural Science, we have organised the time in the following way:

- First week: Introducing the topic and gathering information through an advance organizer and the use of three different intelligences.
- Second week: Creating small products by using three different intelligences.
- Third week: Recording the activities done in the learning folder and writing a self-reflection in the first session to start working in the advert in the second.
- Fourth week: Working on the advertisement as long as students do not finish it.
- Fifth week: Display of the advertisement in front of the class (two first sessions) and completing the self-assessment and the learning folder (last session).

In order to make the distribution of the sessions more clear, we have designed a table (table 5) where we explained the activities, intelligences and objectives that are worked in each week and session of the CLIL module.

Table 5. Sessions' matrix plan.

Week	Sessions	Station/Activity	Objectives
1 Introducing a new topic and gathering information	1	Advance Organizer	Activate prior knowledge
	2	Visual – spatial	Describe the Greenhouse effect Name the Greenhouse gases
	3	Musical	Understand the causes and the risks of Global warming Listen to songs that talk against pollution Listen to explanations about Climate change
	4	Natural	Do an experiment about Greenhouse effect Formulate a hypothesis for an experiment about Greenhouse effect Contrast the results of an experiment with prior knowledge of Greenhouse effect and the initial hypothesis
2 Creating small products	5	Logical- M.	Organize Greenhouse effect and Global warming information in a mind map
	6	Linguistic	Understand human being will not be able to survive if we do not stop damaging the planet. Explain some actions humans beings should do in order to reduce pollution and Greenhouse effect

	7	Bodily-kinesthetic	Explain some actions humans beings should do in order to reduce pollution and Greenhouse effect Describe the Greenhouse effect Understand, know and use orally and in the written medium lexicon and expressions related to Global warming. Examples: Carbon dioxide, CO ₂ , Methane, Nitrous oxide, Greenhouse effect, deforestation, layer, Global warming, reduce, reuse and recycle, radiation, carbon footprint, fossil fuels... Understand the causes and the risks of Global warming
3 Working on the IA intelligence	8	Intra-personal	Reflect on the learning process Explain the own feelings about the Global warming and the work in stations
	9&10	Advert	Understand human being will not be able to survive if we do not stop damaging our planet Explain some actions humans beings should do in order to reduce Greenhouse effect.
4 Creating our final product	11,12&13	Advert	Use modal verbs to express the need of reducing pollution in the Earth Use future and conditional tenses for the expression of cause/effects regarding pollution and Global warming Express agreement and disagreement
5 Exhibitions and reflection	14& 15	Exhibitions	Present orally the advertisement
	16	Self-assessment	Reflect on the learning process Self-assess the own work grading it from 1 to 4 and explain what should be improved in future works

3.5.4. Sessions and activities

3.5.4.1. Introducing a new topic

In the first session all learners will watch a small piece of “Wall·e”¹, the film made by Pixar. This clip last two minutes and will be used by the teacher to introduce the topic of pollution and Global warming

After watching the video, the teacher will ask some questions to the group-class in order to make them reflect on what they now about the topic. The questions can be something like the following ones: “Who is it?”, “What’s its name?”, “What is Wall·e doing?”, “Where is Wall·e?”, “Is Wall·e in our planet?”, “Is it at the Earth?”, “Does the Earth look the same today?”, “What’s different?”, “What do you think could happen?”, “Could it happen in real life?”

From the last question, the learners should start to explain what they know about pollution and the teacher will create a KWL chart, which is an acronym for “what

¹<https://www.youtube.com/watch?v=QHH3iSeDBLo>

learners already Know, what they Want to know, and what they finally Learn” (and you can find in the Annex VII). This chart, which is a graphic used to connect learners to their prior knowledge and feelings about the learning topic, will be hung on some wall of the classroom. The teacher will write on pos-its notes what learners say they know about the topic and stick them on the proper place of the chart. Then, learners will write and stick the questions they have about the topic or “what they want to learn”, and will be able to add questions and answers during the following lessons.

The video, the questions and the KWL chart form an advance organizer and help learners to understand what is the topic about and to self-reflect on what they know and feel about it, realizing they already know some concepts and motivating them to work. Additionally, the KWL chart helps students to take responsibilities in their learning process as they have to think and write what they know and what they want to learn. The chart will be copied so each pupil can have one to keep and compare what they wanted to learn and what they finally learn in the final reflection at the end of the module.

After that, the teacher will introduce the driving question of this module: “How will the world change if Global warming do not stop?”, writing it down at the board together with the main aims of the module. Taking into account that we need the students to understand the curricular objectives, they must be simplify and reduce to: *After studying this topic I can: explain what the Greenhouse effect is, explain what the Global warming is and why it is important to know it, say the name of some gasses that cause Greenhouse effect, do something to reduce the Global warming.*

Then, he or she will explain to the learners that in the following session there will be three different “stations” on the classroom in order to prepare them for the following three sessions. It must be specified that students have to take notes from what they learn in order to be able to do the activities of the second week and that each students must spend a whole session in each station.

3.5.4.2. Gathering information: first week

The procedure of the first week sessions and the sessions of the second week is almost the same. Each station presents the information in a different way and the students must learn the information by themselves spending one class in each station and recording what they learn in notes to gather them in a personal learning folder later. Learners can choose which station they want to go first but they cannot change once they are in one station.

The teacher will have to make sure that children go in groups from one station to another after a whole session in one. Some of them might be allowed to have some extra minutes in the station of naturalist intelligence as long as there is enough space and resources but the teacher must take the final decision.

Furthermore, the students will need the information they can get from the first three stations to work on the ones of the second week. Therefore, they must be aware of this and know the learning objectives since the beginning of the first lesson.

The stations of this week work on the visual, the musical and the naturalist intelligences. The explanation of the activity that learners have to do in each station is written in Table 6.

At the end of each lesson, students must write an “exit leave” in which they write down three sentences or words, one to talk about anything they learn, another for expressing something they liked from the lesson, another to say something they did not understand or dislike. These exits leaves will be read by the teacher and giving back to the students so they can keep them in the personal learning folder and use them to reflect on the whole learning process at the end of the CLIL module.

Table 6. Stations of the first week

STATIONS OF THE FIRST WEEK	
Visual intelligence station  http://www.eyupkulac.com/cokilginc.htm	<i>Using</i> laptops, computers, Ipads or phones and headphones the teacher can provide, learners will watch different videos about the Global warming ² , dictionaries to check any word they do not understand. There are many short videos with the information needed that can be used, so the teacher could add some others but we consider these videos to be enough in order to not get the students bored. Learners will be allowed to stop and review the videos as many times as they want, and they must take notes about what they are watching. This is an individual work although children will be allowed to talk to each other after watching the videos and compare what they wrote if they want.

² <https://www.youtube.com/watch?v=PqxMzKLYrZ4>
<https://www.youtube.com/watch?v=GBQ8-zEcEqw>
<https://www.youtube.com/watch?v=VTfgNFz1DBM>
<https://www.youtube.com/watch?v=lhkgmKXOM1A>
<https://www.youtube.com/watch?v=S7jpMG5DS4Q>
<https://www.youtube.com/watch?v=sAKyhfxrr7s>

Musical intelligence  http://etgclasedemusicadelicia.blogspot.com.es/p/la-pagina-de-i.html	<p>In this station students will listen to songs about Global warming and pollution using laptops, computers, mp3, Ipads or phones and headphones the teacher can provide.³</p> <p>As the songs are short, half an hour might be enough for listening to them, but students might need much more time for checking vocabulary and get the meaning of the songs. The procedure will be the same as in the visual intelligence station.</p>
Natural intelligence  http://sp.depositphotos.com/29939911/stock-illustration-leaf-cartoon-vector-illustration.html	<p>The pupils will need a complete session to do some experiments and teachers will have prepared the materials before the session. Students will need to formulate a hypothesis at the beginning of the lesson, after having read only the introduction to the experiments (e.g. "The greenhouse effect"⁴, the translation in English is available in Annex X). Then, they will be allowed to read the rest of the instructions and do the experiment following them. Finally, they will see if they were right or wrong at the end of the lesson.</p>

3.5.4.3. Creating small products (3 sessions)

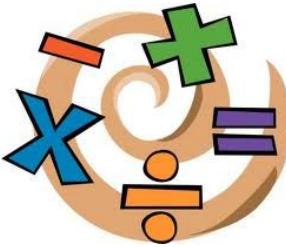
In this part of the module, time must be more flexible than in the first part, as each student is different and some might need more time for finishing a task than others. For this reason, the plan suggest to dedicate three session, one per station, but teachers can let some students to stay a bit longer in a particular station as long as everyone can work without disturb other students' work.

Furthermore, teachers must remind learners to write an exit leave at the end of each session, take them to see what the most difficult concepts for students are, and hand them out again as with the ones from the first week stations.

³<https://www.youtube.com/watch?v=1StkjuGwTvY>
<https://www.youtube.com/watch?v=FzJYcvcNqiE>
<https://www.youtube.com/watch?v=wHj8fk4MCFU>
<https://www.youtube.com/watch?v=nU86xmvfTo>
<https://www.youtube.com/watch?v=LskMeDInzUg>
<https://www.youtube.com/watch?v=C78KE5iGtg4>

⁴http://www.juntadeandalucia.es/medioambiente/site/pacc/menuitem.acad9bbe95916b477fe53b45510e1ca/?vgnextoid=332232c8bc13a210VgnVCM1000001325e50aRCRD&vgnextchannel=f440d58995cf9210VgnVCM2000000624e50aRCRD&lr=lang_es

Table 7. MI stations for Bodily-kinesthetic, linguistic and logical-mathematical intelligences

MAKING PRODUCTS WITH OUR KNOWLEDGE	
Bodily-kinesthetic and Interpersonal intelligences  http://lceadrianarodriguezpalacios.blogspot.com.es/2015_01_01_archive.html?view=classic	<p>The group or groups that work on this station will play charades for the whole session. They will be provided with a hat and inside it, there will be pieces of paper with words and sentences about Global warming, e.g: Greenhouse gases, fossil fuels, Greenhouse effect, deforestation, Earth's surface, Global warming, reduce, reuse and recycle, escaping radiation, carbon footprint, pollution from fossil fuels, melt, warm / rise in temperature and animals' disappearance/ extinction</p> <p>One of the members of each group will take a piece of paper and will have to use mimic to represent the concept or idea while their peers try to guess what it is. Once a child has guessed the meaning of the gestures, that person will take a piece of paper out and do the mimic.</p>
Visual and mathematical intelligence  http://lacarpetadelmaestro.blogspot.com.es/2011_09_01_archive.html	<p>Learners will have to make a mind map about Global warming, pollution and measures to reduce the impact human being has at Earth. For learning how to do it, they will see a tutorial⁵. The teacher must pay attention as learners are likely to ask for help when making the mind map. This is an individual work as each student needs to concentrate and decide how to organize the information. It can be done manually or with computers (if they already know how to use any software to do a mind map) but must show some pictures or draws that represent the most important concepts.</p>
Linguistic intelligence  http://es.123rf.com/imagenes-de-archivo/lengua_boca.html	<p>Learners read a text about Global warming (Annex XI) and then, they will work individually in a slogan they could use for an advertisement about the Global warming. If some of the students are very quick doing their slogans they can start to think about a script for the advertisement they will do in the last part of the module. They will work individually if there are not members of the group in that station that have finished the slogan but will change to pair and group work when other members finish if they do.</p>

⁵<https://www.youtube.com/watch?v=4wZ5wV5dPZc>

3.5.4.4. Working on the intrapersonal intelligence station (1 session)

After having used seven of the eight intelligences, and having received all the main information about Global warming we need to make students reflect on their learning process.

At the end of the whole intervention (not only the CLIL module but after the lessons about MI theory) learners will answer the final questionnaire in which they will have to say which stations they liked the most and in which one they learned more. Providing that the module last other 3 weeks, by the time learners complete the final questionnaire, they will likely have forgotten their feelings and thoughts about MI stations. For this reason, we consider important to have them writing down a reflection right after finishing the work in the stations. Furthermore, self-awareness and self-reflection are part of the intrapersonal intelligence. Therefore, with this session pupils will have worked on the eight intelligences described by Gardner.

The session will start with the teacher asking to the whole group if they remember the KWL chart that they did two weeks before, what it was about and which questions they ask. Then, a copy of the chart and the “Intrapersonal intelligence sheet” will be given to each student, and the teacher will start explaining what they have to do.

Firstly, learners will have to take all the information they collected during the first week and the products they created (the mind map, the slogan and the results of their experiment) to read them again. Next, they will answer the questions of the sheet comparing what they know with the content of the chart.

Finally pupils will keep their pieces of work, their notes, their exit leaves and the “Intrapersonal intelligence sheet” in the personal learning folder. Students will have to write a title for each note and piece of work and keep everything in order, starting with the title of the CLIL module, the objectives, the KWL chart, the notes from the visual and musical intelligences and the paper of the experiment according to which one they work first on; the mind map, the slogan and finally the “Intrapersonal sheet”. Keeping the documents in order will allow them to see how they have been working and learning, getting closer to the objectives of the module and their own aims. This will increase their motivation and will help them to reflect on their learning process. For this reason, the learning folder will be used again at the end of the module, working on the intrapersonal intelligence in the self-assessment session.

In table 8 we can see the sheet pupils need to complete in this session in order to work on the intrapersonal intelligence.

Table 8. Intrapersonal intelligence sheet

Topic: Global warming	
Name:	
Think about the last two weeks and answer the questions.	
How did I feel working in the stations during the first week?	
Which activity did I like the most during the first week?	
How did I feel working in the stations during the second week?	
Which activity did I like the most during the second week?	
What did I learn that I did not know before? (Compare with KWL chart)	
Do I learn everything I wanted to learn? Do I want to learn something else about Global warming?	
Did I learn more during the first week or the second? In which activity did I learn the most? Why?	

3.5.4.5.Creating our final product (5 final lessons)

The content lessons focus on the development of multiple intelligences because that it the aim of this proposal but we cannot forget we are in a CLIL environment. For this reason, learners must use critical thinking skills and work on the 4Cs, which can be done by creating a product as it force children to work on critical thinking skills (cognition), to work cooperatively in groups to create something for the community (culture) and to express themselves in English (communication).

We chose an advert as the final product because it allows students to work on the 4 Cs at the same time that they use all what they learned before and all the intelligences.

Students will have to use their interpersonal intelligence to work in groups of 4 and their natural and logical intelligences to transmit the importance of doing something to stop Global warming. They will also use the visual intelligence to prepare the decoration and the musical one,as they will have to choose a song or create one. The

corporal intelligence is involved as they will perform the advert, and the linguistic one with the slogan and script needed for the advert.

The advertisement must aimed to make people aware of Global warming risks for the Earth and human beings, explaining some of the reasons that cause it and how we can reduce our impact on the Earth and on the Greenhouse effect. Learners should be aware that this final product needs a slogan, which can be taken from the ones they did in the previous lessons, a script, some students to act out the script, decoration at the background or/and on the actors/actress and some music. As it happens with the slogan, if a member of the group wrote a part of or a whole script, they can discuss how to adapt it as a groups instead of starting one from cero.

The teacher will take the role of a guide which means he/she will answer questions, provide materials and give feedback about the different parts of the task (slogan, script, decoration and performance). It is important to keep in mind that this activity is not supposed to be focused on the performance itself but in having our learners using their knowledge about pollution, Global warming and use of persuasive language. Because of this, learners do not need to write down a long script, it might last 3 or 5 minutes or even consist only of a song and a sequence of pictures with some sentences. We must keep in mind that the aim of this activity is to create something with the information they learned, use language and decoration to persuade people, and a slogan to remember the information.

Finally, students should keep writing exit leaves at the end of the sessions. This way the teacher will be able to see if there are any conflicts or doubts he/she needs to help with.

3.5.4.6. Exhibitions (2 sessions)

Once they have designed the advertisement, created all the materials and practiced enough times, they will act out in front of the class in exhibitions not longer than 10 minutes. Therefore, the displays should last no longer than 60 minutes but, taking into account that students will have to reorganize the classroom funiture, the teacher will give some feedback after each performance and learners always waste some time in coming into the classroom and get the materials ready, two sessions are necessary.

The performance will be recorded in video as long as the school and parents allow it. Moreover, it must be completely recorded in the learning folder for future assessment by adding to it the different sections of the advert: the slogan, the script before the teacher correction, the final script and pictures of the decoration they make for the advertisement (as it can be cardboard with different sentences on it, a power

point presentation for the background or for the advert itself and costumes they are going to wear if some). As students have to create the advertisement in groups, all of the sections of the advert must be copied in order to have a piece of work to keep in the personal learning folder. The teacher can photocopy the pieces of work and give them to learners in the last session of the module.

3.5.4.7. Reflection: reflecting on the learning process (1 session)

This last session will be dedicated to self-reflection and self-assessment. Learners will add the new pieces of work to the learning folder with the same procedure as they did before, adding the exit leaves done during the last sessions and completing the self-assessment sheet (Table 9 in the assessment section). Then, they will review their answers to the “intrapersonal sheet”, the new pieces of work and exit leaves.

After that, students will write a final reflection about their learning process, explaining what they learnt during the whole process, what they can do now that could not before, what they liked the most and the least and what they think they could have done better.

3.5.5. Assessment

Assessment cannot be done only at the end of the learning process. As in any other CLIL module, the teacher must use some tools for formative assessment to see whether learners are learning what they need to learn or they need some support.

The main tool for the formative assessment will be the use of a personal learning folder in which learners should keep everything they have done during the CLIL module. Learners will have two sessions (the 8th and the 16th ones) to keep every piece of work they did (from the stations and the advert), together with the exit leaves and write a final reflection. The teacher must check the exit leaves after each lesson and the learning folder after the 8th session to see how learners are improving and help the students to understand all the content before starting the advertisement, as they need to have the concepts clear before it or will not be able to pass the evaluation of the final task. Moreover, the learning folder will be used as a tool for keeping activities and tasks that will support the self-assessment and the final reflection.

Regarding summative assessment, self-assessment will be part of it, together with a final evaluation of the small tasks the learners recorded in the personal learning folder and the grade assigned to the advertisement they do in the last sessions. For assessing all of this, the teacher will have some rubrics that should be shown to the learners in order to make them aware of what is going to be valued. The rubric for the advert is presented in Table 9.

Table 9. Rubric for the assessment of the advertisement

RUBRIC	1 Beginning	2 Developing	3 Accomplished	4 Exemplary
CONTENT Students' advertisement shows they are able to: -Describe what Greenhouse effect and Global Warming are, their causes and their risks. -Explain some actions humans beings should do in order to reduce pollution and Greenhouse effect	-The advertisement does not explain why Global warming is happening or what Greenhouse effect is. -It does not say what actions people should do to reduce pollution.	-The advertisement explains poorly why Global warming is happening, although it explains what Greenhouse effect is.	-The advertisement explains properly why Global warming is happening, what Greenhouse effect is but it does not explain all the risks properly.	-The advertisement explains very well why Global warming is happening, its risks, and what Greenhouse effect is. -It explains 3 or more actions people should do to reduce pollution.
COGNITION The students have been able to: -Create an advert, showing their capacity for description, analysis and evaluation. -customise their advert showing creativity	-The advert does not evaluate Global warming risks and the need of taking actions to reduce pollution. -The advert has a very plain format, not colours or decoration.	-The advert shows analyses Global warming causes but there is not evaluation of the risks and need of taking actions to reduce it. -The advert has a plain format, few colours and very little decoration.	-The advert shows a good analysis of Global warming causes and a good evaluation of the need of taking actions to reduce it. -The advert has a good format, with colours and good decoration.	-The advert shows an excellent analyse Global warming causes and a great evaluation of the need of taking actions to reduce it. - The advert has a very good format, with colours and a lot of decoration.

COMMUNICATION The students' advertisement shows persuasive language, modal verbs, conditional tenses and the student's capacity to use lexicon and expressions related to Global warming.	-Language use is quite bad. The advert has not a good use of conditional tenses or modal verbs and the slogan is not persuasive. -More than 2 serious mistakes in the use of Global warming lexicon.	-Language use is not good enough. It has not conditional sentences and some mistakes in the use of modal verbs although the slogan is good. -There are only 1 or 2 serious mistakes in the use of Global warming lexicon.	-Language use is good. The advert has some mistakes in conditional sentences but a good use of modal verbs and a good slogan. -There are not serious mistakes but some light ones in the use of Global warming lexicon.	-Language use is excellent. The advert has conditional sentences and good use of modal verbs with a great slogan. -Absence of lexicon mistakes.
COMMUNITY Learners' advert shows there are able to understand the importance the planet and nature has for human being.	-The advert does not show concern about Global warming consequences; it does not try to convince people of reducing pollution.	-The advert does not show a big concern about Global warming consequences; it tries to convince people of reducing pollution but does not have good examples or good advices.	-The advert shows concern about Global warming consequences trying to convince people of reducing pollution with few examples and advices.	-The advert shows an important concern about Global warming consequences trying hard to convince people of reducing pollution through examples and advices.

As regard as the learning folder, the teacher will check the “exit leaves” after each lesson and make sure learners keep the activities in the folder. The assessment of it will focus on the recording of all pieces of work. Therefore, the teacher will check that learners include all activities in the learning folder and will ask the students to add or change anything that they do not have or have wrong. We have designed a checklist for this assessment, see Table 10. To understand it, one has to be familiar with the meaning of the terms and abbreviations used:

- GW: Global warming
- GE: Greenhouse effect
- Contrast refers to analyse of what they knew, what they thought and what the experiment taught them, the contrast between the hypothesis and the results.
- Informative: the script and the decoration that students made must inform about the Global warming risks and how to stop it.
- Quality refers to how well the decoration is done, if they draw or cut something, if they use special shapes to write something...
- Evaluation of risks refers to the evaluation of Global warming problem, learners must be able to understand the size of the problem.
- Reflection, learners need to reflect on their own learning, explain what they understood and not from each lesson and how they feel about the topic.

Table 10. Folder checklist

CONCEPT MAP	EXPERIMENT	SLOGAN	SCRIPT	DECORATION	DIARY
Images	Hypothesis	About GW	About GW & GE	Related to the topic	Evaluation of GW risks
GW and GE	Contrast	Try to convince	Informative	Informative	Feelings
Causes	Conclusions	Grammar	Causes	Colourful	Exit leaves
Consequences/risks		Spelling	Actions to be taken	Quality	Concern about GW
Actions			Creative	Creative	Reflection

Another important part of the assessment is students' self-assessment. CLIL approach is student-centred and promotes learners independence. For this reason, teachers must make sure learners reflect on their learning process so they learn from their mistakes and understand the marks they receive. Furthermore, European curricula focus on eight key competences and one of them is "learning to learn" which cannot be done if students do not stop to think about what they did and learn. This relates to the intrapersonal intelligence as it forces learners to do a work of self-awareness.

Taking into account all this, we decided the design a rubric (table XI) to make students think about how much effort they did, how good the results were, what they can improve in future activities and what they have learnt.

Table 11. Self-assessment sheet for learners

Think about what you did, and mark you from 1 to 4, where 1 is “I did not do it”, 2 “I did it but could do it better”, 3 “I did it good enough” and 4 “I did my best”.

SELF-ASSESSMENT						
Experiment	1 Mind map	1 Slogan and script	1 Decoration	1	Music	1
-	-	-	-	-	-	-
4	4	4	4	4	4	4
I thought about what I knew before formulating the hypothesis	I thought about how to organize the information before starting	I thought about GW features before I started writing	I thought about how to express our message with decoration before starting to work	I thought about song I knew that could match with the slogan.		
I formulated good hypothesis	I used images in the mind map	I asked for the words I did not understand	I used different colours	I gave ideas to my peers of what song use		
I compared experiment results with my hypothesis	I explained causes and consequences of GW	I tried to sound convincing with my words	I did an effort to make decoration look nice	I look for songs that sound good and chose a good one		
I explained the experiment in a scientific format	I included actions to reduce the speed of GW	I explained information about GW and how to reduce it	I worked with my teammates without fights	I express my disagreement without fighting with my peers		
Final score						
Did I do a good job? What could I do better next time?						
What did I learn that I did not know? Do I have an answer to all my questions now?						

3.6. MULTIPLE INTELLIGENCES LESSONS

After having finished the advertisements and the exposition of them, there will be two sessions of 50 minutes each one, to learn about MI intelligence. These sessions have the purpose to make pupils understand that different learning strategies can be helpful for them according to their MI profile

To achieve this purpose, during the first session the teacher will focus on making students reflect on their own experience using the different intelligences during the CLIL module. The second one however, will be focus on the understanding of each of the intelligences and the learning strategies helpful for each of them.

3.6.1. First lesson

The first lesson will start with the teacher asking about the preferences of the learners in terms of stations, for instance: “Who enjoyed the mimic activity the most?”, “who liked listening to music more than watching the videos?”, “who thinks that learned more from the natural experiment than from listening to the songs?”

Learners will hand up to answer, so everyone can see that there are differences between their opinions and that not everybody learns the same way. Furthermore, the teacher will have already read and evaluated the learning folders by that time and will be able to make some comments about the differences in learning that can be appreciated from them (always without comparing students in terms of the quality of their work or learning).

After having pointed out that everyone learns in a different way, the teacher will ask if they know why and give the children some time to think and express their opinions. Then, the teacher will ask what they think intelligence is, and after listening to some answers will show Figure 3 to explain it.



Figure 3. Definition of intelligence to explain students (adaptation from the “Real academia española”)

Once the teacher has explained what intelligence is, he/she will give some examples of famous people whose strongest intelligence are different, as a professional of sports, a singer, a painter, a writer, a mathematic, a scientific, a religious person and a famous person who is good at playing or working in a team. These samples should be supported with pictures of these people to attract and maintain learners’ attention, and the names can vary as they should be people the students know well.

A good way to support this explanation would be the use of a Power Point Presentation (or any other digital support) in which a written explanation of the intelligences adapted to the children age could be added. The learners could also add more names to the ones in the presentation, other singers, sportsmen and sportswomen, artists and writers that they know. Moreover, to make learners more interested and create emotions that help them to remember this new information, the teacher could play some videos of intelligent people showing their abilities if there is a good Internet connection in the classroom (the teacher can also download some videos before the session if not).

Figure 4 provides an example of the famous people the teacher could choose for the presentation, as well as a brief explanation of each intelligence. The definitions are an adaptation of the ones given by Armstrong’s (2009, p 6 and 7).

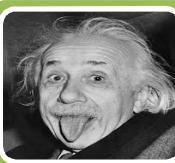
	<p>Naturalistic intelligence</p> <ul style="list-style-type: none">• It's the capacity of identify, observe and clasify elements of nature as plants and animals understanding the relations between them.
	<p>Linguistic intelligence</p> <ul style="list-style-type: none">• It's de capacity of using language efficienly to get a purpose as it can be tell or create stories, poems, news, jokes, through speaking and writing.
	<p>Intrapersonal intelligence</p> <ul style="list-style-type: none">• It's the capacity of recognize the own emotions and feelings and express them in a good way, controlling the own behavior even when the person is feeling very sad, angry or excited.
	<p>Logical-mathematical intelligence</p> <ul style="list-style-type: none">• It's the capacity of using numbers, strategies and logic to find solutions to different problems and to do science.
	<p>Interpersonal intelligence</p> <ul style="list-style-type: none">• It's the capacity of understand what others are feeling, what they are thinking, have friends for a long time and have a good role in social groups.
	<p>Spatial-visual intelligence</p> <ul style="list-style-type: none">• It's the capacity of understanding and representing ideas through draws, painting, sculptures , graphics or other visual representations and to orientate oneself in the space.
	<p>Bodily-kinesthetic intelligence</p> <ul style="list-style-type: none">• It's the capacity of controlling the body to express ideas and feelings or to make different activities with that need perfect movements of the body as repair a car, do a sport or do crafts.
	<p>Musical intelligence</p> <ul style="list-style-type: none">• It's the capacity of understanding and expressing ideas through music, the ability of playing an instrument, of discriminate different voices, rithyms and kind of music.

Figure4.Type of intelligences

3.6.2. Second lesson

During the second session, that will ideally take place right after the first one, the teacher should also explain that everyone learns in a different way, some people learn easier what they see, others what they hear and others what they do.

Next, the teacher can ask the students which they think is their strongest intelligence and what they could do when they are studying for an exam taking into account this

knowledge. Some students might know some suitable learning strategies for them and others no, but must be the learners who correct each other so they think about the topic before having all the solutions. This way, pupils have a specific moment of the learning process to think about, a moment in which learning strategies are more visible as they take the form of techniques. As long as the teacher do not correct any of them, children do not lose their confidence for giving answers and do some good thinking about learning strategies and MI.

The rest of the lesson will be dedicated to explain learning strategies that can be used for each one of the intelligences. For this purpose, the teacher will display the video “The Theory of Multiple Intelligences” by Mai NhiaVang, pausing the record after the explanation of each intelligence and asking students what,a person which strongest intelligence is “x”, can do to study a CLIL subject taking into account what the video says. Now the teacher will give feedback to the learners and will draw a mind map (at the board or the digital board using XMind⁶ or any another Mind map tool) with the following samples:

- Someone with a strong spatial-visual intelligence like Frida Khalo would make draws or charts with the information that is studied or would paint different words in different colours.
- Someone with a strong musical intelligence like Shakira or Pablo Alborán would read aloud the information or even make rhythms, melodies and songs/raps with the concepts and explanations that have to study.
- Someone with a bodily-kinesthetic intelligence as Rafa Nadal or Mireia Belmonte could represent the book activities or some words of the information with movements or making a mock-up.
- Someone with a strong linguistic intelligence like J.K Rowling or Elisabetta Dami (writer of Geronimo Stilton) will create acronyms to remember better the information, will do summaries and read the texts aloud.
- Someone with a strong interpersonal intelligence like Pau Gasol will talk about the topic that is studying with other people and work in group any time he can
- Someone with a strong intrapersonal intelligence like the Dalai Lama will stop to think how he/she feels and what they already know about the topic before starting to study and go for a walk or breathe deeply to relax him/herself and organise the content to get ready to study.

⁶<http://www.xmind.net/>

- Someone with a strong logical-mathematical intelligence like Albert Einstein will organize the information in a mind map and will look for connections between facts and concepts.
- Someone with a strong naturalistic intelligence like Stephen Hawking will classify the content into categories (like in a mind map too), and try to find the connection between the content and the natural world.

Finally, students will do the final survey and show what they have learnt and what might be different for them next time they are preparing an exam or a task for a CLIL module.

4. DISCUSSION

In this intervention proposal we have worked with a pre-post methodology by using an initial and a final questionnaire to complete before and after the whole proposal is implemented. The main reason for using this methodology is the need to know the point of departure and to assess the point of arrival. This way we have designed a proposal whose success can be easily evaluated by comparing the initial questionnaire results with the ones of the final questionnaire. By completing the questionnaire result's sheet for each student, we could see whether pupils have learnt or not what MI theory is and how the MI profile can be used for the selection of learning strategies.

Apart from the questionnaires, our proposal had two main parts. We decided to make students learn a complete CLIL module by using all their multiple intelligences in order to make them experiment the theory. As Cody Blair explained in the learning pyramid, people remember more what they do than what they read or listen. Study a curricular topic from the MI perspective thus, should help learners to achieve a more meaningful learning. Therefore, by using all their intelligences for learning before receiving an explanation of what MI theory is, the memory of this theory will be stronger in learners mind.

The CLIL module was designed around the MI theory application on projects named by Nicholson-Nelson (1988 cited by Richard & Rogers 2014) as Thematic-based projects and the organization of the classroom in corners to work on different intelligences described by Richards & Rogers (2014). This module allowed learners to develop all their intelligences and make themselves aware of which are their strongest and their weakest ones. Working at the same time on the 4 Cs framework designed by Do Coyle

as they have to work in groups to create a product with the content that will help their community making conscience of a topic as important as Global warming.

Additionally, the final sessions about MI and learning strategies, may help students to understand that, as Gardner (1983) explained, everyone learns and is intelligent in a different way. These sessions should also make learners aware of the utility of finding out what is their way of learning. They use their intelligences everyday so they are the ones who know better which intelligences they have developed the most (Armstrong 1994) and these sessions should be enough for making them realize of their profile.

The whole proposal has been designed to create awareness of MI profile and with those two sessions, students learnt which learning strategies benefit different MI profile. Learners, thus, must be able to select the learning strategies more suitable for themselves.

5. CONCLUSION

This section aims to expose the conclusions of the complete dissertation. On the whole, it can be said that the purposes of this study have been reached as the usefulness of MI theory to provide learning strategies to CLIL learners has been proved from a theoretical perspective.

Learning strategies can be exceptional learning tools that provide a great support to learning and to the achievement of excellent academic results. Nonetheless, personal differences among students make impossible the utility of all learning strategies for every learner. People have different characteristics that facilitate their learning through a particular type of activities and sensorial channels or other. Therefore learning strategies must be used according to those personal characteristics.

These personal characteristics have been grouped in two different classifications: learning styles and multiple intelligences. Both concepts appeared as completely different theories but many authors have found connections and overlaps between them. Learning styles and MI intelligences are connected in that both defend that people have different abilities and learn in different ways among other common points.

As regards to MI theory, it is a revolutionary theory that states that human beings do not have only an intelligence but several. Gardner, the creator of the theory, claims the

existence of at least 8 intelligences and keeps looking for more abilities that set the criteria he stated to be considered intelligences. The intelligence according to this theory is not innate, but different intelligences are developed along life depending on factors such as the culture and experiences each person lives.

Our research has shown as the huge impact that this theory has in the educational field. The application of the theory implies a change in the methodology, in how the information is provided to students, how educational activities must be designed and how learners must be assessed. MI theory can be applied in many different ways but they all suppose a considerable step away from the traditional methods of teaching.

In addition, CLIL is a new approach to education that is not connected to MI theory but allows its implementation without much difficulty. Aspects of CLIL such as the need of visual support for scaffolding purposes, the use of project-based and task-based learning and the fact of promoting active and independent learners facilitate the inclusion of the intelligences in the plans. An example of that is the CLIL module of the intervention proposal we designed, in which content and language are taught through all the different intelligences and a final product is created by using all of them.

The MI theory has also been implemented in the second part of our intervention fulfilling the main purpose of this dissertation: designing an intervention to help pupils to learn how to select the most suitable learning strategies for themselves according to their MI profile. Everyone has a unique MI profile, which means that he/she can learn and solve problems more easily when they involve the particular intelligences that the person has developed the most. MI theory thus, can be used to create or select learning strategies in CLIL environments.

To asses our intervention proposal, a pre and a post questionnaire have been used. These two questionnaires provided us with information about the knowledge that CLIL learners had about learning strategies and MI theory before and after the intervention took place. Consequently, it can be concluded that the use of the initial and the final questionnaire are proved of the successful of our intervention.

To summarize, providing the effectiveness of using suitable learning strategies and the usefulness of MI theory to select those learning strategies, we believe that our study has been a success. Although we have not been able to implemented it and see the

results, the aims of the dissertation have been achieved and a new application of MI theory in a CLIL classroom has been shown.

6. FUTURE RESEARCH LINES AND LIMITATIONS

In the last part of this dissertation, we reflect on the limitations we have found and the future lines of research that can be taken. There are different limitations in the particular phases of the dissertation.

Firstly, we found several difficulties during the research. Although there are a lot of books and articles about MI theory, we could not find any that connect the characteristics of a singular intelligence with particular learning strategies. We read different authors who made a clear relation between MI profile and strategies but specifying only teaching strategies. Consequently, we had to choose some of those strategies and adapt them to be used by students instead of teachers.

Likewise, it was impossible for us to find learning strategies for preparing CLIL evaluations. Even though CLIL is an approach that can be used with any language, it usually implies a foreign language, adding some difficulties that would make students benefit from different learning strategies students in a traditional classroom would. We did find some learning strategies for CLIL learners but there are not specific strategies that can help students to be successful in CLIL assessment activities.

As regards to the intervention proposal, it should be noted that it has not been implemented. Therefore, we have not been able to verify if the sessions designed (for the CLIL module and for the teaching of MI theory) meet the aims of the proposal (make CLIL learners aware of their MI profile and provide them with learning strategies that suit their characteristics).

Furthermore, it is essential to understand that the group class can bring some difficulties. The number of students might not allow making groups of 4 and the level of language proficiency might be very different among learners. We also must be aware that this proposal has been designed for students who are used to work cooperatively.

Additionally, we think our proposal could be adapted to higher levels of education and be applied in secondary schools. We also believe it would be really interesting to implement the proposal including a group control. A longer study asking both groups

about what learning strategies they use and evaluating whether the implementation of our proposal causes a change in the selection of strategies in the long term would provide great information. It also could be beneficial to investigate if students who start to use other learning strategies after the intervention improve their academic results.

In conclusion, we would have liked to apply this proposal to see the real results of it and we hope it will be implemented in the future. Moreover, we consider that an adaptation of it and its implementation could provide teachers with really useful information.

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ANNEXES

ANNEX I. “MI checklist for students”. Teacher’s questionnaire

(adapted from Armstrong, 1994, p 35)

Students’ name: _____

Spatial Intelligence

- Reports clear visual images
- Reads maps, charts, and diagrams more easily than text (or if preschool, enjoys looking at more than text)
- Daydreams a lot
- Enjoys art activities
- Is good at drawings
- Likes to view movies, slides, or other visual presentations
- Enjoys doing puzzles, mazes, or similar visual activities
- Builds interesting three-dimensional constructions (e.g., Lego buildings)
- Gets more out of pictures than words while reading
- Doodles on workbooks, worksheets, or other materials

Other Spatial Abilities:

Bodily-Kinesthetic Intelligence

- Excels in one or more sports (or if preschool, shows physical prowess advanced for age)
- Moves, twitches, taps, or fidgets while seated for a long time in one spot
- Cleverly mimics other people’s gestures or mannerisms
- Loves to take things apart and put them back together again
- Puts his/her hands all over something he/she’s just seen
- Enjoys running, jumping, wrestling, or similar activities (or if older, will show these interests in a more “restrained” way—e.g., running to class, jumping over a chair)
- Shows skill in a craft (e.g., woodworking, sewing, mechanics) or good fine-motor coordination in other ways
- Has a dramatic way of expressing herself/himself
- Reports different physical sensations while thinking or working
- Enjoys working with clay or other tactile experiences (e.g., finger painting)

Other Bodily-Kinesthetic Abilities:

Musical Intelligence

- Tells you when music sounds off-key or disturbing in some other way
- Remembers melodies of songs
- Has a good singing voice
- Plays a musical instrument or sings in a choir or other group (or if preschool, enjoys playing percussion instruments and/or singing in a group)
- Has a rhythmic way of speaking or moving
- Unconsciously hums to himself/herself
- Taps rhythmically on the table or desk as he/she works
- Is sensitive to environmental noises (e.g., rain on the roof)
- Responds favorably when a piece of music is put on
- Sings songs that he/she has learned outside of the classroom

Other Musical Abilities

Interpersonal Intelligence

- Enjoys socializing with peers
- Seems to be a natural leader
- Gives advice to friends who have problems
- Seems to be street-smart
- Belongs to clubs, committees, organizations, or informal peer groups
- Enjoys informally teaching other kids
- Likes to play games with other kids
- Has two or more close friends
- Has a good sense of empathy or concern for others
- Is sought out for company by others

Other Interpersonal Abilities:

Intrapersonal Intelligence

- Displays a sense of independence or a strong will
- Has a realistic sense of his/her abilities and weaknesses
- Does well when left alone to play or study
- Marches to the beat of a different drummer in his/her style of living and learning
- Has an interest or hobby that he/she doesn't talk much about
- Has a good sense of self-direction
- Prefers working alone to working with others
- Accurately expresses how he/she is feeling
- Is able to learn from his/her failures and successes in life
- Has good self-esteem

Other Intrapersonal Abilities:

Naturalist Intelligence

- Talks a lot about favorite pets, or preferred spots in nature, during class sharing
- Likes field trips in nature, to the zoo, or to a natural history museum
- Shows sensitivity to natural formations (e.g., while walking outside with the class, will notice mountains, clouds; or if in an urban environment, may show this ability in sensitivity to popular culture "formations" such as sneakers or automobile styles)
- Likes to water and tend to the plants in the classroom
- Likes to hang around the gerbil cage, the aquarium, or the terrarium in class
- Gets excited when studying about ecology, nature, plants, or animals
- Speaks out in class for the rights of animals or the preservation of planet earth
- Enjoys doing nature projects, such as bird watching, collecting butterflies or insects, studying trees, or raising animals
- Brings to school bugs, flowers, leaves, or other natural things to share with classmates or teachers
- Does well in topics at school that involve living systems (e.g., biological topics in science environmental issues in social studies)

Other Naturalist Abilities:

ANNEX II. Initial questionnaire. Students' questionnaire

Name: _____

A. ¿Qué sabes sobre ti mismo/a?**En las asignaturas que estudias o estudiaste en inglés:**

Marca sólo la casilla de tu respuesta:

1. Recuerdas mejor aquello que...	
Ves	
Escuchas	
Haces	

Marca un máximo de 6 opciones y un mínimo de 3 de las siguientes:

2. Las actividades más fáciles para ti son en las que tienes que...	
Trabajar individualmente	
Explicar lo que piensas y lo que quieras	
Trabajar en grupo	
Explicar cómo te sentirías si fuieses el personaje de una historia	
Explicar un proceso o fenómeno natural	
Clasificar conceptos en categorías	
Entender o crear gráficos, mapas conceptuales o murales	
Crear una imagen mental de algo	
Expresar ideas o conceptos usando tu propio cuerpo	
Utilizar la mimica	
Resolver problemas o dilemas	
Descifrar códigos	
Reproducir un sonido o ritmo	
Escuchar atentamente una canción	
Inventar historias, cuentos...	
Hacer presentaciones orales o escritas sobre un tema	

Puntúa del 1 al 4, siendo 1 nunca, 2 a veces, 3 a menudo y 4 siempre.

3. Cuando tienes que estudiar Natural science en lengua inglesa...	1	2	3	4
---	----------	----------	----------	----------

Si estás nervioso/a te das cuenta de que lo estás				
Cuando estás nervioso/a intentas relajarte				
Comentas el tema a estudiar con otros compañeros/as				
Si no entiendes algo y el profesor/a no puede ayudarte le pides ayuda a tus compañeros/as				
Haces dibujos sobre lo que estás estudiando/ pides a alguien que te escriba o dibuje algo que no entiendes				
Subrayas o escribes los apuntes en diferentes colores				
Buscas más información y videos sobre el tema				
Clasificas la información en categorías o cuadros para memorizarla				
Haces mapas mentales o conceptuales				
Buscas entender lógicamente lo que estás estudiando				
Lees los apuntes en voz alta				
Inventas historias con el contenido que estás estudiando				
Escuchas música mientras estudias				
Inventas melodías o rimas con lo que estás estudiando				
Te mueves por la habitación mientras estudias				
Interpretas lo que estás estudiando como si fuera una obra de teatro				

B. ¿Cuáles son tus preferencias?

Marca sólo la casilla de tu respuesta

4. De las asignaturas que estudias en inglés, tu asignatura favorita es:	
Social science	
Natural science	
Drama	
Arts and crafts	
English language	
Otras asignaturas	

5. Teniendo que escribir y hablar en inglés prefieres las actividades en las que tienes que...	
--	--

Trabajar solo/a sin ayuda	
Trabajar con otros compañeros/as	
Investigar el funcionamiento de algo	
Representar conceptos o ideas con dibujos o esquemas	
Construir una maqueta	
Encontrar errores	
Distinguir los sonidos diferentes o extraños	
Entender un texto	

C. ¿Qué sabes sobre la inteligencia y el aprendizaje?

Puntúa del 1 al 4, siendo 1 “Al escucharlas varias veces”, 2 “Al verlas escritas varias veces”, 3 “Al usarlas varias veces” y 4 “Ninguna de las anteriores”.

6. En las asignaturas que se estudian en lengua inglesa como “Natural Science”, todo el mundo aprende nuevas...	1	2	3	4
Palabras				
Expresiones (In my opinion, I think so, all right, I agree...)				
Tiempos verbales (presente como "I play", pasado como I played)				
Relaciones de causa-efecto (si calientas agua a más de 100° la consecuencia es que hierve y se evapora)				
Procedimientos (calcular algo, hacer un gráfico, diseñar un experimento...)				
Características de un organismo o proceso natural				

Puntúa del 1 al 4, siendo 1 nunca, 2 a veces, 3 a menudo y 4 siempre.

7. En las asignaturas que estudia en lengua inglesa una persona muy inteligente...	1	2	3	4
Saca buenas notas en todas las asignaturas				
Es muy bueno dibujando y pintando				
Entiende fácilmente cualquier gráfico				
Escribe historias muy buenas				
Hace exposiciones orales muy divertidas e interesantes				
Formula buenas hipótesis para los experimentos				
Clasifica muy bien características o información en diferentes categorías				
Da buenos consejos a sus compañeros sobre cómo resolver una actividad				
Es siempre el líder en el trabajo en equipo				

Se comporta siempre bien en clase aunque esté enfadado o triste				
Nunca se pone nervioso para un examen				
Esmuybuenoactuando				
Es muy bueno en juegos de mímica o de hacer gestos en general				
Siempre encuentra los errores en las actividades, en el libro o en las explicaciones del profesor/a				
Resuelve los problemas que aparecen en las actividades individuales y grupales				
Crea canciones para acordarse mejor de lo que está estudiando				
Hace rimas con facilidad usando las palabras nuevas del tema				

ANNEX III. Final questionnaire

Name: _____

Strongest intelligences at this moment: _____

Weakness intelligences at this moment: _____

¿Qué has aprendido sobre la inteligencia?

Marca 3 respuestas.

1. Durante el tema sobre la contaminación y el cambio climático que estudiaste en inglés, aprendiste más en las actividades en que...	
Viste videos	
Escuchaste canciones	
Realizaste un experimento	
Hiciste mímica	
Elaboraste un mapa conceptual	
Escribiste un slogan (y un guion si lo hiciste)	
Escribiste en tu diario sobre lo que aprendiste y lo que no	
Trabajaste en grupo	

2. En la asignatura de “Natural Science” que estudias en inglés crees que aprendes más en actividades en las que tienes que...	
Comunicarte (hablar, escribir historias)	
Hacer experimentos	
Moverte, representar cosas con tu cuerpo	
Cantar o seguir un ritmo	
Dibujar o escribir en colores	
Comentar con tus compañeros, tomar decisiones juntos	
Encontrar los errores usando la lógica	
Dar tu opinión, expresar tus sentimientos hacia un tema	

Puntúa del 1 al 4, siendo 1 “en total desacuerdo”, 2 “no creo”, 3 “posiblemente” y 4 “totalmente de acuerdo”.

3. La próxima vez que tengas que estudiar para “Natural Science”...	1	2	3	4
Pensarás cómo te sientes antes de empezar a estudiar				
Comentaráis a otros compañeros/as el tema a estudiar				
Leerás el tema en voz alta				
Subrayarás los apuntes en distintos colores				
Harás un mapa mental sobre el tema				
Moverás tu cuerpo mientras estudias				
Inventarás historias con el tema que estudias				
Clasificarás la información en categorías o cuadros para memorizarla				

Marca la respuesta correcta:

4. Una persona inteligente en la asignatura de "Natural Science" en inglés...	
4.1 Hace bien las actividades en las que tiene que ...	
Trabajarenequipo	
Trabajarindividualmente	
Entender, repetir o inventar canciones	
Utilizar las inteligencias que tiene más desarrolladas, más fuertes	
4.2 Entiende más fácilmente que otras personas cuando el profesor o profesora explica algo nuevo...	
Usandoimágenes	
Usando las inteligencias que tiene más desarrolladas, más fuertes	
Haciendo preguntas para el que alumno/a lo entienda por sí mismo/a	
Utilizando su voz o música	
4.3. Resuelve antes las actividades o exámenes en los que tiene que...	
Encontrar el error gramatical usando la lógica	
Dibujar y nombrar las partes de un organismo	
Utilizar las inteligencias que tiene más desarrolladas, más fuertes	
Escribirunahistoria	

5. Si las inteligencias más fuertes de un/a estudiante son...

5.1 la visual-espacial y la lógico-matemática cuando tenga que estudiar para "Natural Science" u otra asignatura en inglés debería...	
Leer los apuntes en voz alta	
Organizar la información en un mapa conceptual utilizando diferentes colores	
Copiar el tema en color azul	
5.2 la lingüística y la musical	
Hacer rimas o inventará melodías para recitar el tema	
Haceresquemas	
Hacerdibujos	
5.3 la interpersonal y la naturalista	
Representar los contenidos con gestos	
Realizar un experimento con ayuda de sus padres o buscará ejemplos de lo que estudia en la naturaleza (recogiendo hojas, setas, piedras, etc)	
Inventar una historia con lo que tiene que estudiar y la escribirá	

Puntúa del 1 al 4, siendo 1 “Al escucharlas varias veces”, 2 “Al verlas escritas varias veces”, 3 “Al usarlas varias veces” y 4 “Ninguna de las anteriores”.

6. En la asignatura de “Natural Science” en inglés, todo el mundo aprende más fácilmente nuevas...	1	2	3	4
Palabras				
Expresiones (In my opinion, I think so, all right, I agree...)				
Tiempos verbales (presente como "I play", pasado como "I played")				
Relaciones de causa-efecto				
Procedimientos (calcular algo, hacer un gráfico, diseñar un experimento...)				
Características de un organismo natural (plantas, animales)				

ANNEX IV. Analysis of questionnaires: questionnaires' results' sheet

Design of MI profile

Student's name: _____

MI PROFILE			
Intelligences	Students' Questionnaire (initial questionnaire questions 1-5,)	Checklist (Teacher's questionnaire)	Students' final questionnaire
Intrapersonal			
Interpersonal			
Linguistic			
Logical-Mathematical			
Musical			
Visual-spatial			
Bodily-kinaesthetic			
Naturalistic			

According to his/her MI profile his/her strongest intelligences are: _____

According to the final questionnaire the student learned more when using: _____

Complete this table where the numbers (6 and 7 on the left and 3, 4, 5, and 6 on the right) refer to the questions numbers in the initial and final questionnaires. The R refers to the results in terms of right and wrong answers to those questions.

KNOWLEDGE ABOUT INTELLIGENCE			
Q	Initial questionnaire	Q	Final questionnaire
6		3	
7		4	
- -----		5	
- -----		6	
R		R	

Has the student understood MI theory?

Has the student learned which learning strategies select having a specific MI profile?

Annex V. Intelligences related to the questionnaires

Initial questionnaire							
Dimension Questions Options	A.Self-awareness			B.Preferences		C.Intelligence & Learning	
	1	2	3	4	5	6	7
	V	IA	IA	IA/IE	IA	L	All
	L	IA	IA	N/ML	IE	L	V
	BK	IE	IE	BK	N	L	V
		L	IE	V/BK	V	LM	L
		N	V	L	BK	LM/N	L
		N	V		ML	N	N
		V	N		MU		N
		BK	N		L		IE
		BK	LM				IE
		LM	LM				IA
		LM	L				IA
		MU	L				BK
		MU	MU				BK
		L	MU				LM
		V	BK				LM
			BK				MU
							MU
Final questionnaire							
Dimension Questions Options	MI Profile		Strategies		Intelligence and learning		
	1	2	3	4	5	6	
	V	L	IA	4.1	5.1	1: L	
	MU	NA	IE	IE	L	2: V	
	N	BK	MU	IA	LM	3:BK	
	BK	MU	V	MU	V	4:All	
	ML	V	ML	All	5.2		
	L	IE	BK	4.2	MU/L		
	IA	ML	L	V	V		
	IE	IA	NA	All	V		
				LM	5.3		
				MU	BK		
				4.3	N		
				LM	L		
				N			
				All			
				L			

ANNEX VI. Validation of the questionnaires

Assessment grid INITIAL and FINAL QUESTIONNAIRES

In this grid you will find the different items included in the survey. The purpose of the survey is to gather data as regards multiple intelligences awareness of students in the bilingual school and their learning about it after having some lessons about it.

You will find each of items included in the questionnaire in the chart below as well as the aspects to be examined: validity, clarity and relevance. Room for comments for each item is given in case you think that it is necessary to improve it.

Please, rank from 1 to 4 each item as regards validity, clarity and relevance. Remember: 1 none and 4 completely Add comments if necessary				
INITIAL QUESTIONNAIRE				
Question	Validity	Clarity	Relevance	Comments
1. Recuerdas mejor aquello que...				
2. Las actividades más fáciles para ti son en las que tienes que...				
3. Cuando tienes que estudiar "Natural science" en inglés...				
4. De las asignaturas que estudias en inglés, tu asignatura favorita es...				
5. Teniendo que escribir y hablar en inglés prefieres las actividades en las que tienes que...				
6. En las asignaturas que se estudian en lengua inglesa, todo el mundo aprende nuevas...				
7. En las asignaturas que estuda en lengua inglesa una persona muy inteligente...				
Further comments:				

FINAL QUESTIONNAIRE				
Question	Validity	Clarity	Relevance	Comments
1. Durante el tema sobre la contaminación y el cambio climático que estudiaste en inglés, aprendiste más en las actividades en que...				
2. En las asignaturas que estudias en inglés crees que aprendes más en actividades en las que tienes que...				
3. La próxima vez que tengas que estudiar para una asignatura que estudias en inglés...				
4. Una persona inteligente en una asignatura en inglés... Hace bien las actividades en las que tiene que				
5. Entiende más fácilmente que otras personas cuando el profesor o profesora explica algo nuevo...				
6. Resuelve antes las actividades o exámenes en los que tiene que...				
7. En las asignaturas que se estudian en lengua inglesa, todo el mundo aprende nuevas...				
Further comments:				

ANNEX VII. KWL Chart

K-W-L Chart

Topic:

What you Know	Want to know	Learned

Name: _____

Date: _____

ANNEX X. Experiment: The greenhouse effect

Material needed:

Shoes box.	Glass (to cover the box).
Thermometer (to measure the ambient temperature).	Cardboard. Glue.

Step by Step

We propose this simple experiment check the greenhouse effect. First, find a shoes box or a box, it has not to be very long. You just need the box, so you can recycle the lid in the blue container. Along with the box, you will also need a thermometer (but not the one we use when we are ill to check if we have fever), a crystal the size of the box's lid, cardboard and some glue.

When you have all of this, place the thermometer inside the box. Fold the cardboard at right angles, and paste it so that the box remains divided into two parts. The idea is that when you put the box under the sun, the cardboard makes the thermometer be in shadows.

Leave it 15 minutes in this position and record the temperature. Then, without moving the box, cover it with a glass or transparent plastic. Wait another 15 minutes. Look the temperature at the thermometer now, what have happened?

You should see that it has gone up considerably.

How do we explain this?

By putting the transparent cover, the inside of the box is much hotter than without it. That is the greenhouse effect. In this case, the glass lets the light warms the interior of the box. But the glass does not let heat escape, so it stays inside and increases its temperature.

In the atmosphere there are gases called "greenhouse gases effect" that do the same as the glass: let light in but do not let heat goes out and thus, the Earth warms up. As we said above, thanks to these gases the Earth is not an ice floe.

The problem is that in the last 200 years man has thrown an excess of these gases (carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, etc.) and the temperature of the Earth has been increasing, which have already damaged our planet a lot and keep damaging it.

ANNEX XI. Reading sheet

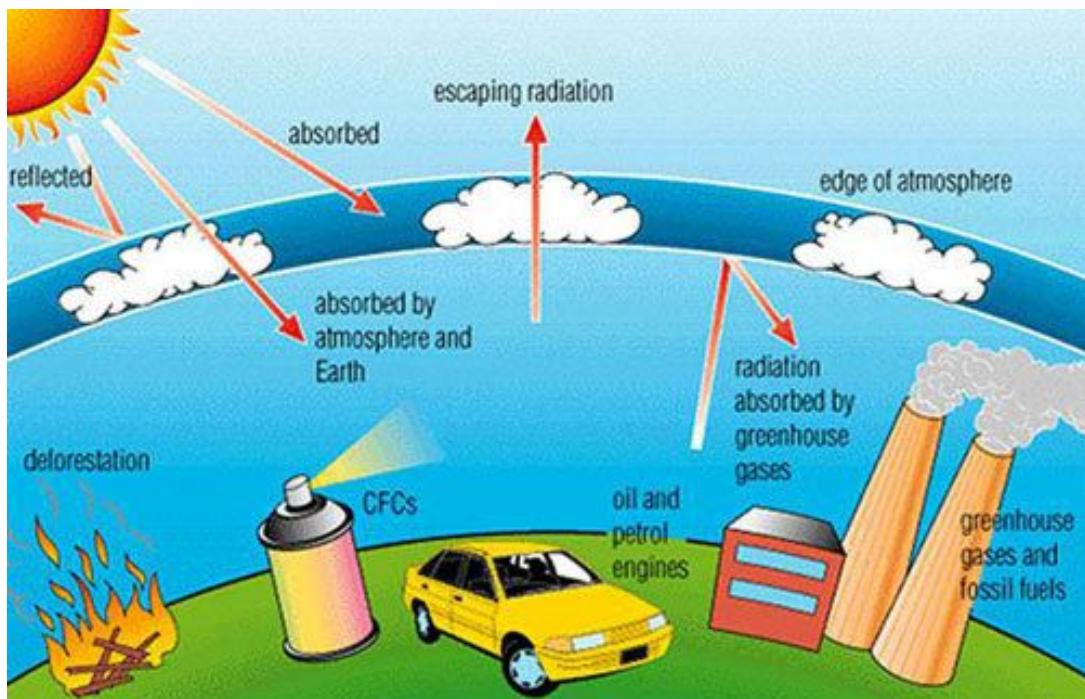
(Adapted from <http://www.kidzworld.com/article/17859-the-kids-guide-to-global-warming>)

Guide to Global Warming

People are seeing change all over the world. **Arctic sea ice** is melting. Glaciers are disappearing. Heat waves, and storms are becoming bigger and more dangerous. Flowers are blooming earlier. In some places, birds are having eggs before they should and bears stopped hibernating.

So what's going on? Our planet is getting warmer, and even a small increase in temperature can change our climate. And when our climate changes, that affects all of us.

A Natural Greenhouse

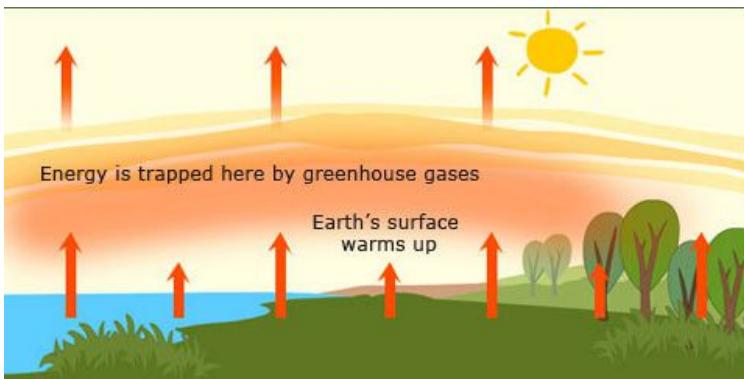


Earth is the only planet we know in which we can live. Our atmosphere is a layer of gases surrounding the Earth that absorbs ultra violet radiation from the sun and stop temperatures from rising a lot or getting too cold. Because of the **Greenhouse effect** the surface of the Earth is warmer than it should be.

The Greenhouse gases help to stop the world from being too hot or too cold. But now, there are more greenhouse gases in the atmosphere making our planet warmer. Greenhouse gases include water vapor (mostly natural source), carbon dioxide (mostly human source), methane (mostly human source) and nitrous oxide (mostly human source).

Temperature Rising

From 1995 Earth suffered the 11 hottest years of the last 100. The world is getting warmer. When the world's temperatures get warmer, a few things happen. The water cycle goes faster, causing more rain, wildfires and extreme heat waves. There are more greenhouse gases in the air because the atmosphere can't absorb more. Arctic ice and glaciers melt sooner and faster. The oceans warm and cause sea levels to rise, which can cause water contamination and cities and islands can end up under the water. Many animals like turtles need beaches for their eggs or different aquatic plants to eat and can disappear.



You CAN Help!

Here are some changes you can make in your life to help prevent:

- Plant trees
- Start a seed bank (keep the seeds of many varieties of plants stored away safely)
- Change every light in your house to an energy-saving bulb
- Reduce, reuse, recycle paper, plastic and glass
- Wear a sweater or jumper and turn off the heat in your house in winter
- Wear shirts and shorts when it's hot and open the windows turning off the fan
- Turn lights and computers off and unplug them when you are not using them
- Only turn the wash-machine one when it's full
- Take short showers
- Don't use the car to go everywhere and use your bike, or walk or take the bus
- Don't buy bottles of water, drink tap water