

Master's Dissertation/ Trabajo Fin de Máster

EXPLORING CLIL-BASED PEDAGOGICAL STRATEGIES FOR SKILLS TRAINING OF ENGLISH TEACHERS FROM SECONDARY EDUCATION IN THE CITY OF GUAYAQUIL, ECUADOR

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ABSTRACT AND KEYWORDS

Recently, the CLIL approach has seen significant advancement within different contexts in various parts of the world. Its introduction and implementation, for example, has been well received by many educational institutions in the city of Guayaquil, Ecuador, the place where I live and work. The problem that normally occurs, at least referring to this specific context, is the little integration demonstrated by secondary education teachers in terms of the synchronized management of linguistic abilities and the academic content of the subjects from the school curriculum. Due to the importance of such a methodology, this work aims to discuss the skills secondary school teachers should develop in terms of the relationship with the knowledge they have of their basic curricular subject, their foreign language competence, in this case, English, and their pedagogical abilities. Based on this, the main focus of this work is to present and discuss a methodological proposal for teacher training oriented to CLIL in secondary education in the city of Guayaquil, Ecuador. This is to happen in such a way that it should allow the teacher to transmit their linguistic and content knowledge in a systematic and informed way, thus achieving better integration of the curricular contents of the subjects and the management of the foreign language. To achieve this objective, a formative orientation is privileged in order to bring awareness to teachers in terms of which communicative skills they should develop as to reach the goal of language and content integration in such a local educational setting. Besides the issues mentioned, this thesis seeks to demonstrate how a Task-based teaching methodology naturally contemplates the 4Cs and therefore has the potential to improve CLIL lessons. With that in mind, a didactic proposal is finally presented as an example of how Task-based teaching can be used and implemented in a CLIL classroom.

Key Words: CLIL; teaching skills; secondary education; Task-based teaching; Ecuadorian context

RESUMEN & PALABRAS CLAVES

Recientemente, el enfoque CLIL ha experimentado un avance significativo en diferentes contextos en varias partes del mundo. Su introducción e implementación, por ejemplo, ha sido bien recibida por muchas instituciones educativas en la ciudad de Guayaquil, Ecuador, el lugar donde vivo y trabajo. El problema que se presenta normalmente, al menos referido a este contexto específico, es la poca integración demostrada por los docentes de educación secundaria en cuanto al manejo sincronizado de las habilidades lingüísticas y el contenido académico de las asignaturas del currículo escolar. Debido a la importancia de esta metodología, este trabajo tiene como objetivo discutir las habilidades que deben desarrollar los docentes de las escuelas secundarias locales en términos de la relación con el conocimiento que tienen de su materia curricular básica, su competencia en lengua extranjera, en este caso, el inglés y sus habilidades pedagógicas. En base a esto, el enfoque principal de este trabajo es presentar y discutir una propuesta metodológica para la formación docente orientada a CLIL en la educación secundaria en la ciudad de Guayaquil, Ecuador. Esto debe suceder de tal manera que permita al docente transmitir sus conocimientos lingüísticos y de contenidos de manera sistemática e informada, logrando así una mejor integración de los contenidos curriculares de las asignaturas y el manejo de la lengua extranjera. Para lograr este objetivo, se privilegia una orientación formativa con el fin de concienciar a los docentes sobre qué habilidades comunicativas deben desarrollar para alcanzar el objetivo de integración del lenguaje y los contenidos en un entorno educativo tan local. Además de los temas mencionados, esta tesis busca demostrar cómo una metodología de enseñanza basada en tareas contempla naturalmente las 4C y, por lo tanto, tiene el potencial de mejorar las lecciones CLIL. Con eso en mente, finalmente se presenta una propuesta didáctica como ejemplo de cómo se puede utilizar e implementar la enseñanza basada en tareas en un aula CLIL.

Palabras claves: CLIL; habilidades de enseñanza; educación Secundaria; Enseñanza basada en tareas; Contexto ecuatoriano

1. INTRODUCTION

Education is one of the most influential factors in the construction of the vital trajectories of individuals and social groups. That is why learning another language helps people to cross borders, either to obtain a better education, a better job or simply the satisfaction of having acquired another language and enriched one's cultural background. As an example of such a challenge, we can refer to the process of learning a global language like English in countries where the dominant mother tongue is Spanish (González, et, al, 2015).

In Latin America, efforts to improve the teaching and learning of the English language appeared from a contribution given at the Dakar Convention, Senegal, held in 2000, where many challenges were raised in order to work towards and reach the "Education for all" objective. According to this forum, the need arises to include a teaching-learning model of the English language in academic curricula which comprised foreign language education. In other words, teaching languages through the contents of a subject is possible through the different approaches to teaching second languages or foreign languages that reflect both the needs of the students to learn as well as the abilities of the teachers to teach.

This is all based on the fact that English is a fundamental language for social and professional interaction in today's globalized world. Concerning what is stated in this paragraph, it is very clear that educational institutions in Latin America today are pushed to prepare students for a brighter future. This means attending to their educational systems in order to be competent to the point that they can fully provide students with the means to function fully and competently in their daily tasks for which the command of this foreign language is necessary and, in some cases, crucial (Kumaravadivelu, 2003).

Based on the declarations that came out of the aforementioned Dakar Convention, it is necessary to consider that governments are faithful to commitments to the point that they have to ensure that the goals and objectives of "Education for All" are achieved and sustainable in time. This is a responsibility that needs to be carried out efficiently, and, for sure, it is to require strong alliances and cooperation between countries through regional and international institutions and organizations. Within this line of thought, it is important to be clear that based on the impulse that the teaching of the English language has had in the 1990s in our region, Latin American countries

such as Argentina, Chile, Colombia, among others, have promoted its incorporation into their basic education curricula (Tocalli-Beller, 2007).

Mastering the English language is becoming increasingly essential in all social settings. This need has visibly increased with the advent of the so-called new information and communication technologies (NICTs) as they foster the knowledge and development of various communication strategies along with the use of educational software, technological resources, and gadgets such as smartphones, tablets, iPhones, just to name a few. In addition, innovative work alternatives are proposed in different fields of the social domain, different forms and modalities of education (e.g., E-learning), in which the command of the English language is fully required (Meléndez, 2014).

By focusing on a more specific context of the Ecuadorian educational system, it was determined by authorities that, within the pedagogical model of Ecuadorian educational institutions, ways and means have been devised on how to make the English language a primary subject within the scope of their teaching-learning strategies. In other words, although the teaching of the English language officially gained strength 30 years ago in Ecuador, in practical terms, progress has not yet managed to overcome social inequalities. Historically, unequal access to quality services in public education compared to private education historically increases the huge gap of social inequality in the country (Betancourt, 2004).

In Ecuador, English was initially considered an elective discipline within the academic curriculum. According to national regulations, each institution had the power to include or not English within its teaching-learning pedagogical project. On the other hand, secondary education institutions had the possibility of discerning the number of teaching hours that they would offer within their study plan in reference to the teaching of this foreign language.

Based on the scenario described above, we can point out that this reality changed significantly in 2014 when the national government of the Republic of Ecuador decided to address and handle the learning of foreign languages in a better way, particularly English. In terms of local regulations, changes through ministerial agreements were proposed, taking into consideration the opportunities national students could miss if they wished to study at foreign universities whose main vehicular language is. It was due to this complex setting, aligned with the national curricular guidelines, that the Government of the Republic of Ecuador decided to propose changes in such realm through ministerial agreements and legal decisions (Patarroyo, 2011).

Still discussing the issue, one of these ministerial education agreements worth citing is the Agreement No. 0052-14, which entered into force in the 2016-2017 school year in the Sierra region and during the 2017-2018 period in the Costa region¹. Because of this still short period of time in terms of implementation, there are no measurable results of change yet as teachers have not reached the level of demand established by the national government in order to reach a minimum level of proficiency of the foreign language, which according to Common European Framework of Reference for Languages (CEFR), would be around B2. They have not either been evaluated in terms of depicting an adequate methodological and pedagogical background to teach the language. The agreement is applied in educational institutions managed by the Ministry of Education, which corresponds to ten years of Basic General Education and three years of Baccalaureate.

As we know, the teaching of a language or any other subject does not refer only to presenting content, in any way, and to anyone. For the teaching and learning processes to be effective, it is necessary to take into account what type of knowledge is oriented and to whom. In addition, we need to take into consideration the social context of the students. From this, the methodologies are designed and implemented according to the reality(ies) the teacher is going to address. For this, a teaching orientation must first be chosen and then the stakeholders need to clarify objectives and think of the results to be achieved, as well as choose and prepare learning experiences according to pre-defined didactic principles to finally evaluate the students' performance and learning achievements.

The existence of different types of methodologies applied by teachers in different areas of knowledge (mathematics, natural sciences, knowledge of the social and cultural natural environment, among others) makes the teacher focus on teaching English only as a second language. This translates into avoiding combining skills related to the adequate use of English as the main support in the teaching of other subjects. To achieve this, the teacher must acquire skills training in such a way that this work allows him/her to achieve better linguistic competence. In other words, it is important to refer to the type of teaching in which the subjects or parts of them are

¹ The Sierra is a geographical region of the Republic of Ecuador that extends from north to south through the Andes, its height usually ranges from 1800 m to 6268 m, it is characterized by its impressive mountainous elevations, volcanoes and snow-capped mountains. Among the most important are the Cotopaxi and the Chimborazo. Its 10 provinces have cities of great historical importance such as Quito, Cuenca, Latacunga, Riobamba, Ibarra, Ambato and Loja, and artisan centers such as Otavalo. The Costa region —also known as the littoral region— is one of the four geographic regions into which the Republic of Ecuador is divided. It is located between the Andes Mountain range and the Pacific Ocean. It extends through the provinces of Esmeraldas, Santo Domingo de los Tsáchilas, Manabí, Los Ríos, Guayas, Santa Elena and El Oro. The main and most populated city in this region is Guayaquil.

taught through a foreign language with the aim of acquiring content and the simultaneous learning of the second language.

Based on the literature we have in teacher education nowadays; it is paramount to consider the different approaches that foster a combination of content and language teaching and learning in the most diverse educational settings. The one approach that orients this work is CLIL (Content and Language Integrated Learning). As well known, CLIL has been playing an important role in this process as an educational approach to reinforce linguistic diversity and as a powerful tool that is to have a strong impact on the teaching of languages now and, for sure, in years to come.

To achieve success in the implementation of the CLIL methodology in a context like ours, it is important to be clear that there must be permanent investment in teacher education both at pre-service and in-service levels. In this way, teachers are allowed to be educated on how to work on and give attention to content and language. At the same time, this also turns out to be a challenge for practitioners since it is essential to carry out both the evaluation of the results as well as the entire process of teaching-learning.

As previously mentioned, integrated learning of content and foreign language aims to use the language as a means to learn other different types of content instead of having the language being learned as a subject itself. Several definitions of CLIL can be found in the specialized literature. Nevertheless, one of the most often cited world over is that by (Marsh and Langé, 2000, p. 16) who conceive CLIL as “a dual-focused education approach in which an additional language is used for the learning and teaching of both content and language.” The dual-focused component outlines the fact that CLIL pursues two main aims: one related to the subject or theme, and the other focused on the language. Specifically, CLIL encompasses the basic principles of teacher performance in bilingual educational contexts, as argued by (Pérez Cañado, 2016).

As it has been indicated, a CLIL lesson is not only a combination of the contents of a subject transmitted in a given foreign language, but it goes beyond that. In other words, it refers to the use of a methodology based on a pedagogical model. Theoretically speaking, within the field, which has solidly developed in the last decades, (Coyle, 1999) conceived what she came to call the ‘4C curriculum’ in CLIL programs. According to the author, a successful CLIL lesson must combine the following elements:

a. Content: Progression in knowledge, skills and understanding related to specific elements of a defined curriculum. Content matter is not only about acquiring knowledge and skills, it is about

the learners creating their own knowledge and understanding and developing skills (personalized learning);

b. Communication: Using language to learn to use language and use language to learn. Language needs to be learned which is related to the learning context, that is to say, learning through that language, reconstructing the content and its related cognitive processes. This language needs to be transparent and accessible; interaction in the learning context is fundamental to learning. This has implications when the learning context operates through the medium of a foreign language.

c. Cognition: Developing thinking skills which link concept formation (abstract and concrete), understanding and language. Content is related to learning and thinking (cognition). To enable the learners to create their own interpretation of content; it must be analyzed for its linguistic demands; thinking processes (cognition) need to be analyzed in terms of their linguistic demands.

d. Culture: Exposure to alternative perspectives and shared understandings, which deepen awareness of otherness and self. The relationship between cultures and languages is complex. Intercultural awareness is fundamental to CLIL. Its rightful place is at the core of CLIL (Coyle, 2006).

The so-called ‘4Cs framework’ for CLIL starts with content (such as subject matter, themes, cross-curricular approaches) and focuses on the interrelationship between content (subject matter), communication (language), cognition (thinking), and culture (awareness of self and ‘otherness’) to build on the synergies of integrating learning (content and cognition) and language learning (communication and cultures). There are several models and methods which are connected to the 4Cs framework (see Figure 1), and due to this adoption of the tenets of the framework, they can surely be used to conceive lessons, materials, and evaluation tasks within such orientation.

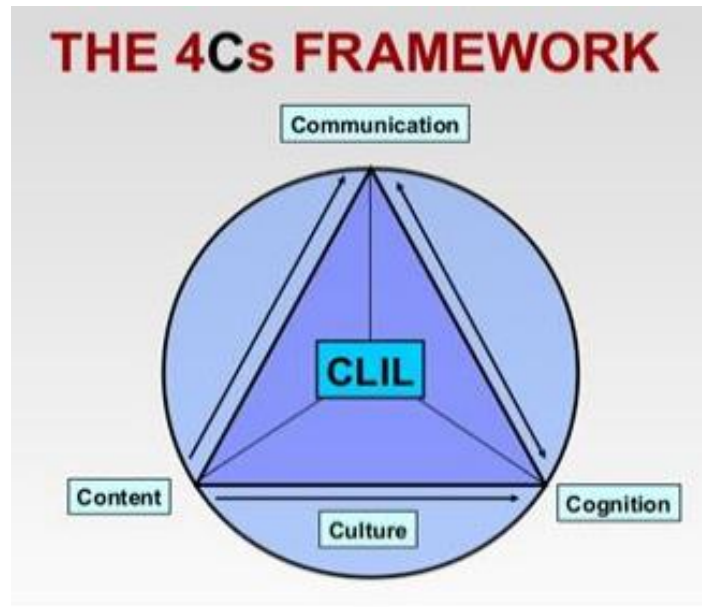


Figure 1: The 4Cs framework (Coyle, Hood and Marsh, 2010)

For instance, Meyer’s CLIL Pyramid (Meyer 2012, p.18), which incorporates elements from the 4Cs framework, is designed in such way that it provides systematic steps for the planning of a CLIL unit, as shown in Figure 2 below:

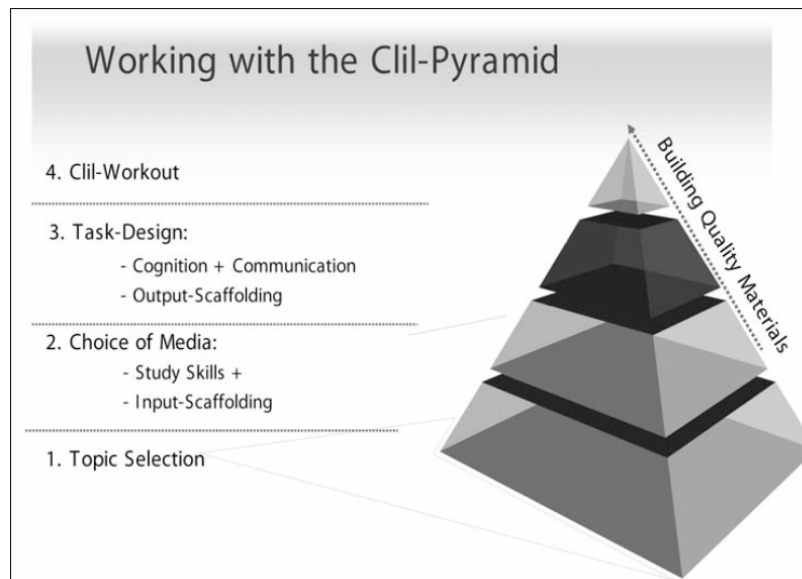


Figure 2: The pyramidal model proposed by Meyer (2010)

Meyer's pyramidal model offers a guide that aims at creating teaching materials appropriate to CLIL contexts. It is a flexible planning tool that enables teachers to develop innovative materials based on several key planning and teaching strategies, as well as supporting the student to move from lower order to higher order thinking skills. Along with this, for producing quality CLIL material, scaffolding strategies must be taken into account both at the stage of choosing the media to use (texts, images, films, etc.) and at the phase of task design. The amount and type of input and output scaffolding needed are determined by the type of input selected and by the nature of the desired output (text presentation, painting, outline, etc.).

Another theoretical development that has gained solid ground in CLIL scholarship is *The Language Triptych* also conceived by Do Coyle (2007). The language triptych, in the author's view, supports teachers in the planning of linguistic scaffolding, deepening in the section on learning a language through CLIL. For her, it is important to consider the need to integrate cognitively demanding content with the use and learning that language. For this, Coyle, et al. (2010) have established a representation through a "Language Triptych" that helps to understand how to interrelate the content objectives with the language learning objectives. The triptych then provides the means to analyze language needs within CLIL contexts and distinguishes the types of language demand that impact CLIL. In other words, according to the author, operating in a CLIL context, it is important that we reconceptualize the process of language learning, which can take language in three different dimensions, 'language OF learning', 'language FOR learning', and 'Language THROUGH learning' (see Figure 3 below):

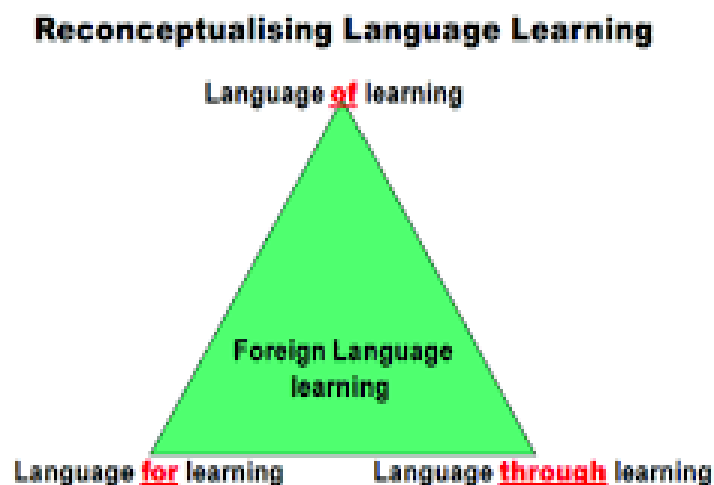


Figure 3: The Language Triptych (Coyle, 2007; Coyle, Hood & Marsh, 2010)

It is important to highlight that the triptych is not conceived to replace the grammatical progression but rather it is supposed to enhance it. The framework supports students in the use of the language through the analysis of the vehicular language used in CLIL from the aforementioned three interrelated perspectives.

Having worked on this very brief introduction, we arrive at the methodological aspects to be presented in the short chapter which follows. Basically, we are to discuss the research problem that has oriented this final thesis along with both general and specific objectives, and a more detailed explanation of the didactical proposal for teacher training we have conceived.

2. METHODOLOGICAL ASPECTS

2.1 Research problem and research question

As mentioned in the Introduction, for this final assignment of the MIEB, I decided to present a didactic proposal for teachers of English who are to be working in the local educational context of Guayaquil, Ecuador, teaching both content and language. For this process to take place, the research problem that is to orient this Master's thesis is the following: What skills and competencies do teachers of English from secondary schools in the city of Guayaquil, Ecuador, need to develop in order to conduct their work and feel secure about their educational practices in a CLIL-based context?

In order to address the research problem, here it is the question which is to orient the proposal presented and discussed in this work: How can a CLIL-based didactic proposal contribute to the development and improvement of teaching skills and competencies for the enrichment of pedagogical processes and educational practices in secondary schools in the city of Guayaquil?

2.2 Objectives

The *general objective* of this work is to contribute to the training and development of local teachers from secondary schools in the city of Guayaquil, Ecuador, through the implementation of a CLIL-based didactic proposal envisioning the acquisition of skills and competencies for the teaching of one or more subjects of the local academic curriculum through English.

Aligned with the general objective of this work seeking to achieve it, I have established the following *specific objectives*:

- Investigate the main trends in the direction of the teaching-learning process both in language and content in secondary schools in Guayaquil.
- Identify the teaching methods or approaches used by local practitioners to teach both language and content in secondary schools in the city of Guayaquil, examining in a non-judgmental way their advantages and disadvantages in teaching English as a foreign language in the context of the target institutions.

- Design a CLIL-based didactic proposal to foster in local teachers of English skills and competencies for the application and implementation of this approach in secondary schools in the city of Guayaquil, Ecuador.

In the next chapter, I will introduce and discuss the main theoretical and conceptual considerations that serve as foundation and support to this final work.

3. THEORETICAL FRAMEWORK

3.1 Introduction

In order to have more profound knowledge regarding this chapter, it is essential to get fairly acquainted with the CLIL concept and provide the reader with a better understanding of this new academic paradigm of teaching-learning. Also, it is of great importance to the work describe the local panorama from a global perspective, as much as the fundamentals in the Ecuadorian model which are to be studied in detail. Here, I also explain and discuss preliminarily the needs and actions of the training of CLIL teachers in the schools and colleges of the city of Guayaquil-Ecuador, which are the key object of study in this Master's thesis.

3.2 English Language Teaching-Learning Methodologies

Throughout history, various methodologies have emerged in the field of language teaching. These have evolved, adapting to the different needs of students and modern societies. An analysis of the main methods used from the nineteenth century on shows how language pedagogy developed and focused on the teaching of modern languages. Along the years, we can clearly see that significant changes have arisen from the twentieth century. First, in these brief elaborations, I will mention the main contributions to language teaching, in this particular case, the English language teaching (ELT). Then, I will highlight the most significant features of some perspectives, and what makes them stand out from each other.

Based on what was stated in the previous paragraph when I was talking about traditional methods in ELT, there are various teaching-learning methodologies, including the very first of them, the Grammar-translation Method. It is the first and oldest method widely used in the teaching of modern languages, inheriting its use from the teaching of Latin. This methodology lasted for many years, from the nineteenth century, 1840, until reaching the middle of the twentieth century, around 1960, as indicated (García-Medall, 2001). Translation in language teaching is a deductive method based on rote learning of grammatical rules that are then applied in various repetition exercises. It is important to be clear that this methodology is framed in a historical era where the main objective is that students who study the language can read different texts in the

original language, especially literary texts. In fact, what mattered was to make them competent in a certain language at an academic level.

Learning the lexical and syntactic forms of the language is no longer enough to be able to communicate. Then, the Direct Method arises; it aims for students to learn the language directly, without resorting to translation. It is the first method that occurs within the idea of presenting the act of learning of the second language with a focus on understanding not only the syntactic form of the language, but that the student can develop the ability to communicate naturally in the target language. On the other hand, the role of the teacher is important because he has to provide the necessary resources so that through images or representations, the students can understand the new vocabulary presented. In addition, students communicate in class in the language in which they are instructed and simulate real life situations that can be shared and discussed by them.

A direct method for the teaching of a language such as English is essential. Through this methodology learning becomes much more dynamic, and even the passive role of the student is transformed, strengthening his/her relationship with the teacher, developing a new form of collaborative learning. In this sense, according to Hernández (2000), students are stimulated to establish a direct connection between the foreign word and the reality to which it calls; in other words, students associate the forms of speech with actions, objects, gestures, and situations without the help of the mother tongue. Here the teacher repeats a word pointing to the object it denotes and does so as many times as necessary until the student can reproduce it and later on finally acquire it.

Within the realm of FL teaching methods, one of the best known is the Audio-Lingual Method or Oral Audio Method, which in many ways draws on Skinner's behaviorist theories. In 1953, Skinner's first studies of behavioral psychology and theories related to language acquisition appeared. Skinner (1957) states that the way through which the grammatical structures necessary to communicate in any language are acquired is through "operant conditioning". This conditioning is carried out through the repetition and memorization of the grammatical structures of the language. All this is achieved through constant reinforcements and stimuli. In this case, the role of the teacher in this method is fundamental since it is necessary for the teacher to direct, control, and perfectly model the dialogues exposed in the class. The priority is the oral base. After this, reading and writing are introduced, but their learning is quite limited. The goal, as mentioned before, is for the student to be able to communicate orally, in contrast to the methods used in previous decades.

Meanwhile, and as a reaction to the weaknesses of the Audio-Lingual Method, in the mid-1960s, the didactic proposal Cognitive Code Approach emerged, which considers the student as the central axis of his/her own learning. Its forerunner was John. B. Carroll (1966), and the method he designed is based on cognitive psychology and Chomsky's principles of generative grammar. It can be said that this approach is one of the first to appear founded in the new cognitivist theories developed at that time. The CCA proposed to allow the student to produce a learning and significant use of language. The teacher was supposed to present situations in which the same student was able to anchor the new learning in his previous knowledge. To catch on from his/her own errors is considered a requirement of this proposal since this helps the student to be aware of what he/she is doing and that such a posture is part of the learning process.

Other important methodological initiatives such as the Communicative Approach (Richards & Rogers, 2001) indicate that all this movement arises mainly as a British novelty, which even influences the development of a different curriculum in terms of teaching foreign languages. Still, by the mid-1970s, this new approach had already expanded both in America and Europe.

In this scenery, we should also consider the Silent Method developed by Gattengo (1972) who holds that learning should be subordinate to teaching. He believed that teaching meant serving the teaching-learning process rather than mastering it. In this method, the role of the student is accentuated significantly, leaving the teacher relegated to the background. The most important thing, and hence the same way, is that "silence" is a tool to provoke the student to learn by himself. In the words of Gattengo (1972, p. 80), "the teacher's strict avoidance of repetition forces alertness and concentration on the part of the learners."

Another method in which the science of suggestion is involved is Suggestopedia. According to its founder, Dr. Lozanov (1978), this method states that we normally create psychological barriers to learning. Through Suggestopedia, the teacher leads students into engaging in the process of "desubordination", favoring not only the involvement of a greater part of the student's brain but also other components of the personality such as emotions. That is, the main role of the teacher is to "desuggest" the psychological barriers that students have during the teaching-learning process. According to Larsen-Freeman et al (2011), it is the teacher's responsibility to orchestrate those suggestive factors in the teaching-learning process, so it can help break the barriers and overcome obstacles created by the students themselves towards their learning capacity.

We all know that science never stops. In any area of knowledge, science is in constant change. It is not static, particularly in the field of education sciences. Based on this, it is easy to realize that such a condition has continuously led to the emergence of new methods and approaches to make teaching processes increasingly effective.

Within the mosaic of language teaching methods and approaches it is worth mentioning authors such as Curran (1972) from Loyola University of Chicago, who proposed a method known as Consulted Learning or Humanistic Learning. This method is restricted to the amount and level of prior knowledge possessed by students as one of its premises is that students should be familiar with the role of a counselor. The teacher must be prepared to accept the students' rejection and must be willing to work without the related materials and to motivate learning in the class. Lessons must be culturally sensitive and the design of the course is to seek its compatibility with the community. Special training is also required to apply learning techniques.

The work carried out by Curran is important since it allows the teacher to mature through his/her experience, as much as it allows the teaching-learning model to become a complement to what today is a teaching model based on content in the English language. It is very important to note that the teacher in these modern times becomes a very important guide, and methods like this supports the teacher in terms of having the opportunities to develop different skills, so as to be able to combine the curricular part of the subjects taught and the mastery of the foreign language.

Feria Llerena (2019), in his research, presents and approaches the development of a topic based on the Application of the Flipped Classroom pedagogical model for the teaching and learning of grammar in English in intermediate students of the Universidad Católica San Pablo, Arequipa. This study aimed to determine the effectiveness of the Flipped Classroom² Pedagogical Model to improve the learning of grammar in the past, present and future times of Intermediate Level English. It is important to be clear that the method proposed by Feria Llerena (2019) is based on the teaching of English as a model of language learning, but not the way to use the ability of the language combined with the development of mastery of a particular subject of the academic curriculum. In other words, the teacher does not combine the teaching of the discipline with the foreign language.

² A flipped class inverts the sequence of presenting instructional material and application so that students come prepared to class to interact with a classroom of peers and an instructor as they share, test, apply and integrate the material with their prior knowledge.

In the context of the new model of training of English teachers Peña (2010) adds to this previous focusing on the idea of providing English teachers with theoretical-methodological foundations related to the main pedagogical categories of oral expression ability in English, within a systemic-communicative and professional-pedagogical approach. However, it is important to consider that the approach should be oriented towards learning and teaching English through the curricular content of a subject of the academic curriculum in the school. The teaching-learning model proposes that the method adopted by the teacher should focus on the content of the subject as well as the mastery of the English language.

The teachers who carry out these teaching orientations are specialists in their discipline. These methodologies are to ensure that the teacher has the proper knowledge of the subject he/she is teaching in the classroom (science, mathematics, geography, etc.). On the other hand, there is the teacher who has an extraordinary mastery in the teaching of the foreign language, however, the objective of this study is to determine in a theoretical way a methodology that allows the teacher to have a mastery of these two skills. Therefore, through his teaching, the teacher allows students to acquire knowledge of different disciplines in a foreign language, in our case, the English language.

With what has been stated in previous paragraphs, we begin to reflect and realize that it is essential that in modern education it is necessary to combine both the teaching of the foreign language as well as the teaching based on the curricular contents of the different subjects that are ~~given~~ taught in regular schools. That is, the teaching of the English language through the school curriculum. For this to happen more frequently and more natural, we can resort to an approach that is based on the learning of a language through the content of a subject of the curriculum. Of course, as we all know, I am talking about CLIL. Although the term CLIL is relatively new, as it was first used in 1994, it is not a new educational phenomenon or something modern, but rather a concept that has been present throughout the evolution of humanity since ancient times.

3.3 Principles of Content and Foreign Language Integrated Learning (CLIL)

The term CLIL (Content and Language Integrated Learning) was first coined and used in Europe in 1994. As a result of globalization and the linguistic demands of the moment, there was a growing interest in language acquisition and the most effective methodologies, thus giving rise to its appearance. However, despite being a recent term, CLIL encompasses different educational

approaches in which the focus is on both content and instructional language acquisition (Marsh, 2006).

Immersion programs are part of that range of methodologies that were developed in the previous decades. In 1965, one of the most remarkable experiences took place in Québec (Canada). The early total immersion program of St. Lambert (Lambert & Tucker, 1972), through which it was intended to meet the needs of the Anglo-Saxon group living in the French-speaking area. Given the social and political situation of the moment, a group of families expressed the importance of adopting measures that eradicated the deficiencies that their children presented with the French language and the situation of disadvantage in which they found themselves.

Given the problems families were, the community proceeded to request help from experts such as Wallace Lambert and Wilder Penfield, who then developed an immersion program through which this group had the opportunity to study the academic contents in their second language from the first years of schooling (Gennese, Lambert & Holobow, 1986). Thus, efforts were dedicated to the development of competencies that would allow basic communication to subsequently broaden the focus on the set of skills. As students progressed through the work done at school, some subjects began to be taught in English (Mehisto, Marsh & Frigols, 2008). The results obtained showed the success of the program (Gennese, Lambert & Holobow, 1986) and that experience was taken as the starting point for the subsequent expansion of this type of initiative both in the country and in other parts of the world.

With all the above, CLIL began to acquire relevance and stand as an important alternative to existing models to respond to the demands of bilingual education. To talk about this approach is to refer to an innovative and integrating term that was created to respond to the demands and needs of the moment, offering the opportunity for students to acquire and learn second languages in a significant way without paying attention to the socioeconomic context of the collective³ (Marsh & Langé, 2000).

Currently, in Spain, there are many educational centers that have bilingual programs and that have been conducting very relevant work under the spirit of CLIL. In addition, in teacher training

³ Within the society or group, socioeconomic factors are considered as a substantial and indispensable part, currently, due to the lack of economic capacity in certain social groups, difficulties increase day by day, human beings with a low economic level can have many more problems in different areas of their life, such as: health, employment, education, a roof to live in, etc., this occurs due to the scarce resources that individuals with low socioeconomic status offer to their loved ones.

centers there is a wide variety of courses for teachers to acquire more knowledge in this regard. However, although the autonomous communities are increasingly promoting bilingual programs in different schools based on this perspective, there is not one single approach that fits all contexts, since we are faced with different students with different needs, diverse realities, and teachers who are familiar with different methodologies and have received different training. That is, as expected, CLIL is to be used as an umbrella terms to serve as a point of departure in terms of bilingual education always paying attention to local realities.

Since 1995, the European Union has launched a genuine strategy on multilingualism (European Commission, 1995), from which an innovative methodological approach to language teaching called CLIL (Content and Language Integrated Learning) had emerged. In Spain, for instance, CLIL has been a lever for changing and updating language standards (Pérez Cañado, 2016).

But CLIL is not present only in Europe. It has spread to different parts of the world, as aforementioned. In a work carried out in Argentina in a bilingual school called “Integrated Learning of Contents and Foreign Languages”, Cendoya, Di Bin & Peluffo (2008) argue that the foreign language is taught from a discursive perspective where students are able to produce oral and written texts to develop their linguistic skills in a language other than the mother tongue, as learning should not be forced, once students function in different situations that arise in their daily life, In other words, CLIL proposes a more effective way of learning for students, since it focuses on the development of the necessary skills to integrate functional and communicative English in the day-to-day.

Analyzing in context what Cendoya et al (2008) call attention to, it is important to consider that the approach used helps students to focus their learning on the fluency of the language, as this is something very important. However, it is worth mentioning that the methodological application it proposes will not be adequate if the purpose is to prevent the student from learning the content of a subject. From that point of view, it is notorious that something fundamental is lost, which is the significant learning of the curricular content in another language. This makes it clear that the student is more focused only on the learning of the English language and in a “non-forced” way, and not on interaction between the content of the subject and the language. Besides, that work of interaction involves a lot of work for the student, for what is expected of him, an adequate development in thinking skills throughout his school stage.

Another study, I would like to comment here is the one by bedoya and it was conducted in Peru. The premise of the work is that the radio is a didactic resource that helps capture the attention of students to achieve meaningful and constructive learning in the development of communication skills. That is, communication skills are developed in a better way when the didactic resources that are used are of great interest to students.

Still according to Peñarrieta (2010), the use of the radio, the internet, television, among other resources, for didactic support in the learning of the language is extremely relevant. In her view, these resources are important since the student is normally struck by the use of these “Extras” in the process of learning the language. These resources provide students with the opportunity to build knowledge significantly in their learning, obtaining with this an improvement in the development of the basic communicative skills of the language. However, it is important to remember that the focus of this research is different as its primary objective is the teaching and learning of the foreign language and the curricular contents at the same time. It is clear that the proper use of this methodological approach leads to the student breaking the traditional barrier of learning only the language, and, on the other hand, to ensure that the teacher can master and ~~can~~ combine these two skills. That is, he/she can teach the English language and, at the same time, teach the curricular content of their subjects within the normal school classroom.

Another research I would like to cite here is the one carried out in Santander, Colombia. Researchers studied the implementation of the CLIL (Integrated Learning of Contents and Language) through literature in a group of students between 11 and 12 years of age. As part of the scope of the work conducted by Abascal (2016), several activities were designed departing from the reading of different literary texts such as dramatizations, summaries and songs, the same ones that allowed students to enrich the language. As a result, it was determined that literature stimulates the acquisition of English providing meaningful learning while increasing interest and motivation, indeed making language learning happen in a more meaningful way (Abascal 2016).

As mentioned, it is important to be clear that the teacher must master the ability to teach the language, and also the ability to teach the curricular content of a subject in another language, other than the native tongue of his/her locality. That is why it is fundamental teachers engage in total concentration not only in the teaching of languages but also in the process of teaching content. It is important that the teacher masters this ability to combine the language and the curricular contents in the school, although for Abascal (2016), using the CLIL methodology can be worrying if that

the teacher does not master such a methodology or if they are not familiarized enough in order to apply the methodology.

One last study I would like to mention is the one carried out by Valenzuela (2015) in Ecuador. Entitled “Recreational activities in the development of communicative skills in English”, the work considers that it is necessary to use productive didactic resources, and the teacher must have a broad knowledge of how to handle them within the classroom. It is also recommended to use them according to the ages of each of the levels with which he/she works in order to develop students’ communicative skills. What the author mentions is really important, but we must make it clear that the didactic resources that serve as support for the teacher are not enough since the fundamental element that needs to be considered is how teachers are prepared in terms of skills to conduct such a work. In other words, when using the curricular didactic resources in the classroom teachers must be well trained to give an appropriate use to the materials, since they are tools that contribute significantly in the teaching-learning process of contents in combination with the foreign language. By doing this, for sure, students can participate with efficiency and use their skills in all spheres of communication and human society.

3.4 Integrated Teaching-Learning Methods of Content and Foreign Language in Ecuador

Education in Ecuador is no different from several Latin American countries, Spanish being the official language, and also counting on its ancestral languages. Our economy and business in general are marked by promoting internationalization and globalization, which requires citizens to use English as a language of mobility and communication for tourism, scientific production, academic translations, or jobs in general. Likewise, education in Ecuador seeks that students demonstrate a high command of the English language as a foreign language.

The development of English language teaching in Ecuador has made use of traditional models for decades. Studies by Calle et al (2012) have shown that English teachers in Ecuador normally focus on teaching grammar and dictate it out of context. This has occurred despite the provision for the application of the communicative model as a contribution to the Curricular Reform project for the Improvement of the Teaching-Learning of English (CRADLE), which began in 1993 (Ministry of Education and Cultures of Ecuador, 2009). Complex explanations regarding grammatical structures consumed the 2 or 3 hours of English classes taught in middle

school each week. In this regard, it is pointed out that in English classes, “it was barely possible to speak a few words in a foreign language” (Galán, 2012, p. 18).

Along this line of thought, Quiñonez (2016, p. 2) argues that in Ecuador, the selection of English language teaching methodologies is “based on the knowledge and understanding that each teacher has about them, and they are constantly changing in order to comply with local and international educational profiles and parameters.” However, the author leaves very open the way which the teacher should teach. For this reason, it is important to determine methodologies that the teacher could use as a standard when teaching. The lack of preparation to go beyond the teaching of the English language has made the teacher in our context an expert English Teacher only. However, when it came to teach subjects in English, the whole situation became a real challenge for them. In many ways, there was a lot of improvisation, normally leading students into taking the curricular contents very lightly since teachers did not know how to reach the student in the proper teaching of a given subject other than English itself. And this state of affairs has changed very little over the years. That is why, in my view, it is important that teachers are given opportunities to have access to constant training. However, the review carried out shows that the development and application of the CLIL approach is the trend that holds great potential to replace traditional methods in bilingual education.

In the Ecuadorian context, at the beginning of 2019, the traditional approach to the teaching and learning of the English language as a foreign language persists in the vast majority of schools, especially in public schools. This anachronistic situation remains despite the mandate by the presidency of the Republic of Ecuador through the Ministry of Education, to apply the CLIL model from 2016 on (Morocho Jácome & Salgado Campaña, 2019).

With that scenario in mind, I would be tempted to say that due to the persistence of the use of English language learning from the academic curriculum, it is important to reflect and clearly establish the advanced challenge proposed by the new curriculum. For this to happen, we need to take into consideration the limitations related to the classroom practice that remains centered on the teacher. It is my contention then that such practices must be overcome and we should also stop persisting in the use of outdated methods like the Grammar Translation Method, for instance, since there are gaps and failures in the application of the communicative approach that, most notably, have avoided generating adequate learning environments, making it almost impossible to articulate activities that promote sociability among peers.

Actually, what I would like to highlight is that learning and teaching oriented by a CLIL approach have as primary objective to teach the language and curricular content of a subject at a time. That is why it is proposed that to impart knowledge teachers should be exposed to the appropriate use of this methodological approach, thus make use of innovative resources as this will prevent learning from being shown in a traditional way where only the teacher is the one who dictates the whole class and the students are the ones who passively receive content.

In sum, although in Ecuador the possibility of using the CLIL approach in primary and secondary education in both public and private schools is already a reality, the full implementation of this approach has not yet been given the best use. In other words, secondary school teachers in the country are not yet sufficiently qualified to achieve this objective, once most of those fellow teachers have not yet acquired the skills and competences of the CLIL approach in order to feel comfortable to engage in this endeavor. Needless to say, that this is because proper and democratized training in this approach is not offered in a systemic way in our country, a problem that needs to be addressed urgently, so teachers can be given the opportunity to grasp a full understanding of the approach and all the skills that need to be developed to put in practice the best and most comfortable way they can.

3.5 Brief conceptualization of the term CLIL

As we already know, the integrated treatment of languages and foreign language-oriented content teaching is called CLIL, or Content and Language Integrated Learning, as defined by Coyle, Hood & Marsh (2010). CLIL is a dual-dimensional educational approach in which an additional language is used for the teaching of both a language and content. This means that in the teaching-learning process, there is a two-way approach, both in content and language. Each is important, even if the emphasis is greater on one or the other at a given time.

To understand CLIL, and how to integrate the teaching of both content and language in a given program, we have to highlight the different components that make up the methodology and how these are related. To do this, CLIL researchers developed a frame of reference that integrates four blocks elaborated within a context (Coyle, Hood & Marsh, 2010), confirm this model pointing out that the framework is "built on the premise that quality CLIL is dependent on understanding and operationalizing approaches which will not be found solely in the traditional repertoires of either language teaching or subject teaching" (p. 41). The authors suggest that a unit based on

CLIL must be constructed under the theory of the 4Cs and under other CLIL principles. They explain each of the Cs as follows:

Content: The central point of the content lies not only in the acquisition of knowledge and skills, but in students creating their own knowledge and the development of skills (personalized learning). It is the content that initially guides the overall planning along the learning path. “The lesson should include the content of the area that allows progress in knowledge, skills, and understanding of the specific topics of a given curriculum” (Coyle, Hood & Marsh, 2010, p. 41).

Cognition: Content is related to learning and thinking. For CLIL to be effective, it must challenge students to create new knowledge and develop new skills through reflection and participation in higher-order thoughts as well as lower-order thoughts. “CLIL is not about transferring knowledge from an expert to a novice, CLIL tries to allow individuals to construct their own interpretations and for them to be questioned” (Coyle, Hood & Marsh, 2010, p. 41).

Communication: The language needs to be learned, being related to the learning context, learning it through that language, reconstructing the content and cognitive processes related to it. That language needs to be transparent and accessible. Interaction in the context of learning is critical for learning to take place. This has implications when the learning context operates through a foreign language. Thus, “the language is used to learn while learning to use the language itself in a communicative way” (Coyle, Hood & Marsh, 2010, p. 41).

Culture: Studying through a different language is critical to fostering intercultural understanding. This aspect includes intercultural elements in the planning of the project: for example, establishing the context of the content in different cultures. “This allows exposure to varied perspectives and shared knowledge that make students more aware of the other and of oneself” (Coyle, Hood & Marsh, 2010, p. 41).

Considering that CLIL is a significant methodology whose primary principle is to use language as a vehicle to transmit knowledge, it is necessary to highlight another important relationship expressed by (Kramsch, et, al. 2009, p. 3) as she affirms that “language is the main means by which we conduct our social lives.” So, complements the author “when used in communication contexts, [language] links to culture in multiple and complex ways.”

Within this line of thought Marsh (2000) would argue that learners are given opportunities to use another language naturally by using the CLIL Method. To do this, learners are to concentrate on the subject of learning and not only on the use of the target language. (Marsh, Maljers &

Hartiala, 2001) complement such an idea, pointing out that the CLIL method reinforces what has been learned in subjects such as literature, history or science, that is, by putting the foreign language into practice, through the promotion of ‘I can do it’.

For Pavesi et al (2001), foreign language teachers have extensive knowledge of the pedagogical content of various subjects, a quality that is used to launch educational projects with the CLIL model. This learning model, they would argue, offers opportunities for foreign language practice that turns out to be more realistic and natural. Thus, the learner soon forgets that he/she is acquiring a language and concentrates on learning the content but making use of the foreign language. In this case, of course, the language turns out to be a key ingredient for success in the exchange of information and knowledge.

3.6 Teacher training and CLIL

The determining role of education in society and the dynamics of interrelations that occur in it are not limited to education but have implications in the conception of the duty to be, the perception and resolution of problems of society that transcend the immediate present. This leads to changes in teacher training. As previously mentioned, language learning, one of the key objectives of twenty-first century society, seeks to respond to the multiple demands that citizens around the world are to face today. As De Moreno (2009) would assert, this is a consequence of the numerous social, political, economic, technological, and educational changes produced during the last decades, so being linguistically and communicatively competent in at least one second language is presented as an urgent need.

The teacher as a crucial player in the realm of education is by nature a main actor for society, as he/she becomes a transmitter of the culture that has preceded him/her and a promoter of the learning process through education in general. As Vygotsky (1986) cited in (Nieva Chaves & Martínez Chacón, 2016: 21), the educational process must be “planned, organized and anticipated from the development of the subjects”. That is, as I defend here, for this process to happen the best way possible, it is crucial that teachers engage in ongoing teacher education and training processes. Despite the fact that we all agree with the importance of such measures, teacher training has not always received the special attention it deserves, including in Ecuador, the context where I live. This is to say that, unfortunately, the teacher as an active subject of learning has been scarcely attended to, both from the perspective of initial and ongoing training, which creates a paradox

since teachers are to be seen and taken the main protagonists in the processes of development and transformation within education.

From this perspective, the permanent training of the teacher as an active subject of learning appears as a fundamental role in the development of linguistic competence combined with the strength of the mastery of the subject of the school curriculum. Hence, teacher training for CLIL environments is extremely important. are optimal, For the teacher working in CLIL-based programs it is crucial that he/she engages in the development of a series specific skills that will surely add to his/her profile. Among these skills, we can cite the design of a CLIL curriculum that integrates language, content and strategies, or the ability to select, adapt, elaborate and evaluate materials (Palacios, Gómez & Huertas, 2018).

Within such a scenario, we cannot forget that the mastery of linguistic and non-linguistic content is not the only requirement for CLIL teachers as, in my view, that should acquire methodological techniques to help their students develop their own skills. It is also necessary for this to take place that primary and secondary education institutions consider the benefits and promote the potential that ICTs have within the teacher training process since these can surely serve as facilitating tools for teacher training and practice (Murray & Christison, 2010; 2014).

Certainly, there are important quality criteria that define the work of CLIL teachers. We can point out, for instance, a high linguistic competence in both the mother and foreign languages and the capacity to transmit the contents of non-linguistic areas in that foreign language. Methodological techniques are required to allow the tandem between language teachers and content teachers to be successful (Pérez-Cañado, 2016b). At this point, it is important to take into consideration that when talking about the competencies that CLIL teachers need to have in order to conduct their work the best way possible, these may include: knowledge of the L1 to understand the difficulties of the students and a good command of the language used for instruction, good knowledge of the topics of the content, production of solid lesson plans, planning and organization of lessons according to cognitive demands, and gradual progression of content and language.

The growing importance given to the competency approach in teacher training stems from the greater consideration of their work as a profession that has a specific professional profile and different from that of other professionals. An important contribution to conceptualize what it means to understand the practice of teaching as a profession and take from there the implications for training. The main objective of such initiatives is to provide future teachers with the right tools

to work with adaptations to the common curriculum of school education. This aspect is decisive since it presents a clear intentionality related to the content that must be present in training programs involving CLIL teachers. We cannot forget that the mastery of linguistic and non-linguistic content is not the only requirement for CLIL teachers in this sense. In other words, we cannot ignore the specific methodological treatment that bilingual education requires and implies, therefore, its own and specific training agendas for teachers (Espinar, 2019).

According to what was mentioned above, we can assert that the CLIL methodology involves the implementation of a totally new approach, which means that new pedagogical resources and teaching methodologies are required (Urmeneta et al., 2011). This compromises not only a transformation of the educational system, but also the quality of teachers' work at all educational levels, once they brace together to acquire new specific skills essential for the mastery of such knowledge, resources and technology.

In this concern, Hillyard (2011) argues that the teaching competencies required for CLIL programs are extensive and demand considerable assimilation time for any educator attending a CLIL-based development course. In terms of professional competencies, teachers should start by getting familiar with the definition of CLIL and all the steps for its adaptation to the local context. They should know how to integrate CLIL tenets and procedures into the curriculum and ensure that quality measures are taken. Likewise, Pérez Cañado (2016) affirms that the main competences associated with a bilingual teacher are linguistic competence, intercultural competence, curricular competence, methodological competence, organizational competence, interpersonal competence, collaborative competence and competence of reflection and development.

3.7 CLIL teacher training in Ecuador

To better understand the need for training of local teacher of English and its impact, it is necessary to investigate some historical aspects by going back to the past and briefly getting to know theoretical aspects about the FL teaching approach implemented in Ecuador, as well as its development in the classroom.

In Ecuador, the theoretical development of English language teaching has in many situations favored the communicative approach, as posed by Alcón (2004). Withing this very well-known perspective, the ultimate objective of the student is to achieve a communicative competence once he or she becomes the center of the teaching-learning process. For this case, it is asserted that the communicative approach is considered as the paradigm that still today takes the lead in the

teaching process of languages. This, in reality, has highly influenced Ecuadorian public policies when it came to the teaching and learning of languages, including English. Since 1993, a reform known as the CRADLE project (Curriculum Reform Aimed at the Development of the Learning of English) was initiated, with the implementation of six English textbooks called “Our World Through English” (Ministry of Education and Culture of Ecuador, 2009 as cited in Calle et al., 2012). In 2010, a change conducted by the Ministry of Education in terms of teaching English began to take place. It is when we experience the advent of the so-called “English Strengthening Project”, which basically maintains the communicative approach in teaching as a guide to be followed and establishes learning achievements according to the Common European Framework of Reference (Ministry of Education, 2013a & b). Three new textbooks are thus introduced in the classrooms all over the country. These series approved by the Ministry of Education are distributed during the school period of the Sierra region in the year 2012-2013.

Along with this process of change and innovation, the National Secretariat of Higher Education of Ecuador, Science, Technology, and Innovation (SENESCYT, 2012 & 2013) granted in April 2013, 325 scholarships to English teachers within the “Teach English Program” where fellow teachers are trained for a period of 7 months in different universities in the United States of America. These teachers were part of a second phase of scholarships, since some time before 354 scholarships were awarded to another group of Ecuadorian teachers of English. The “Teach English Program” began in mid-2011 (El Universo, 2013). According to (SENESCYT, 2012, p.107), the main objective of this program was “to strengthen the knowledge and teaching methodologies of the English language of future teachers at public schools in Ecuador, and in this way, guarantee that young people in their years of schooling learn this language with a good level”. After completing the training program, the so-called fellows should then work as Ecuadorian national teachers for a period of two years and pass an English proficiency exam that accredits them with at least a B2 level.

Bearing this scenario in mind, it is important to mention that there is not a reflective element, in other words, teacher training strategies are not encouraged, which allow them to develop their skills in the process of integrated learning of content and foreign language in the teaching programs for English teachers in the country. Despite the opportunities that teachers have had in terms of improvement of their language skills in other English-speaking countries, the overall benefits seem not to be reflected in many contexts. Until today, this knowledge applied in the students of

Ecuadorian secondary schools, especially in the schools of the city of Guayaquil, has not reached the quality that should be expected for any national FL program. Unfortunately, students still lack the knowledge of English and its application to real life. And this also involves the appropriate combination of the language and the curricular contents of the subjects in the official curricula.

Once I describe this to a certain extent poor situation in terms of ELT education in Ecuador, I can affirm that it is clear that for our English teachers to improve the quality of their work and their profiles as a whole, they do need to engage in more systematic and continuous teacher training programs, encompassing both their linguistic competence and the knowledge related to the classroom approaches which can promote a real communicative context, typical of an approach in which the language is used to learn and so commonly used in real life situations. When it comes to CLIL based programs we cannot forget that the content teacher many times lack basic skills concerning English. So, I defend the thesis that it is extremely relevant to include this component in teacher training courses as the profile of the content teacher also needs a lot of training concerning their level of linguistic competence. In other words, they are the ones who need training on how to use this language as a vehicle for learning the contents they teach through it.

This is how the approach that integrates content and foreign language has become increasingly important since bilingual programs began to be implemented in numerous autonomous communities of Ecuador. Although CLIL has been developing for more than thirty years in some European countries, especially in Spain, it is still a relatively recent methodology in Latin American countries. In Ecuador, specifically, this type of methodology is usually implemented when it has already been tested in other countries. Despite the success CLIL has ameliorated in different countries, in Ecuador, it is still struggling to achieve an acceptance at the level of all districts of secondary education. Until now, I can say that a consolidation of the methodology has not been significant due to different factors, including the lack of knowledge on the part of teachers. We can see that so far, they have not been able to successfully combine the use of the language and the mastery of the curricular content, which until now has been maintained in isolation. That is, a group of teachers master English but not the content of the subject of the school curriculum while the other group of teachers dominates the content of the subject, but still depict important deficiencies in the mastery of the foreign language of instruction.

Having said that, I argue here that when it comes to bilingual education in general, one of the most important challenges in all types of content-based language experiences, i.e., non-

immersive programs, in which content prevails over language, CLIL included, is teacher training (Morton, 2016). At the level of universities in Ecuador, where teachers are prepared in the area of English in their classrooms, the academic needs that teachers require so that they can face the challenges posed by society are not being met. Once teachers do not acquire enough knowledge to work with new methodologies when it comes to being the main protagonist of the teaching of the new generations of students at the school level, several gaps emerge, and we can easily predict that the education provided will be permeated by different types and levels of deficiency. In my view, for things to improve this pre-service education should be considered in the habilitation process that is necessary in a context in which there is still a deficient planning of the initial and permanent training of teachers to face the challenges of the new emerging educational models.

Likewise, teacher training is a determining factor in the quality of teaching and learning processes. Based on this statement, the diagnosis of the methodological training needs to work with CLIL can serve so that the plans aimed at the training of this group of teachers are oriented to meet their real needs and therefore guarantee good training to plan and design CLIL lessons (Pérez Cañado, 2018). The reality that schools and colleges experience in Ecuador, especially in the city of Guayaquil, is not very promising. It is very common to hear and see that teachers improvise when teaching a subject in the English language, and this is due to the lack of preparation that these teachers present. With that picture in mind, it is important to be clear that the use of the CLIL methodology in Ecuador may in the long run push local academic standards. And, in my view, it is indeed a very promising path to follow because when it comes to students being able to learn another language, research has shown that the combination of the appropriate use of the language and the curricular content of a subject is the best way to learn any new language.

In this sense, Marsh (2012) points out how research has shown that by providing secondary school teachers with the right knowledge and skills to develop this type of integrated teaching (language and content), students' access to more complex learning contexts naturally happens, and, for sure, this can contribute to the improvement of linguistic and academic outcomes. This point made by Marsh (2012) is fundamental, but, unfortunately, the secondary school teachers in the different educational institutions, whether private or public in the city of Guayaquil, do not have those skills at the required level due to the little preparation they have received during their academic years. Thus, in order to progress in their own learning many teachers in Ecuador invest

in a type of self-taught training so they acquire the necessary knowledge to be able to apply new methodologies like CLIL or similar ones related to bilingual education.

The importance of this brief research work is exactly to concentrate on teachers' being able to master these two elements present in this pedagogical process, Integrated Learning of Contents and Foreign Languages. As we know, it does bring many advantages, being one of the most important to offer all the possibilities to help students connect the knowledge they learn at school with what happens in real life. This, for sure, makes learning more meaningful and more exciting. In this way, when learning is meaningful the students themselves see that entire content (language and subject knowledge) as useful and necessary for their future. In addition, the classes taught through CLIL are fun and motivating, something of great importance in the teaching-learning processes, since students are to be more involved in their learning.

Another advantage of CLIL is the preparation it gives the student to function in today's globalized world. This means preparing the student specifically for future studies and jobs which they will be able to access as they start mastering the second language learned at school. Finally, as part of this process, we can say that the acquisition of such knowledge naturally leads students in developing multilingual interests and attitudes as they get the chance to start interacting with people from different parts of the world and that come from different linguistic backgrounds.

CLIL surely has many positive points and thus many supporters. But, as we know, it also has its detractors that normally enjoy pointing out its disadvantages. One of the disadvantages that CLIL detractors mention frequently is the poor preparation of teachers in order to teach CLIL-based classes. They call attention to the fact that a lot of teachers do not have enough level of English to implement CLIL optimally, and we have to admit this is a reality in many contexts, including my own. That is why I do find important to reflect on this issue since in part it involves Ecuadorian higher education, especially the universities of the city of Guayaquil. When we get involved in this field of study, we see clearly that future teachers are not being prepared adequately to face new teaching methodologies, and that as a nominated effect, is affecting future generations, especially students who attend public schools.

Bearing this in mind, in this thesis I defend the position that the CLIL approach can be very interesting when carried out in the classroom since it constitutes a motivating element for students as much as teaching a foreign language taking advantage of the teaching of non-linguistic contents. However, we should not stay on the surface and think that this is all, once the CLIL methodology

demands certain requirements and conditions, and the fact of not providing them in the classroom can harm students in the learning process of non-linguistic subjects.

Therefore, if we want CLIL to be a methodology that guarantees optimal bilingual education, this means that it must be put in place so that these conditions occur in practice. And, of course, from the corresponding legal and institutional scope, it must be promoted in such way that good training of teachers in CLIL can occur on a very regular basis. We cannot deny the heterogeneity in the competency profile of the CLIL teacher in many contexts (Herrero, 2015; Coyle, 2011; Pérez Cañado, 2018). In Ecuador, I can say that this problem derives from a habilitation model that relegates methodological training to the will of the teacher. I think this needs to be re-evaluated and re-framed by those involved in public policies as I see as necessary to determine the different training needs in CLIL for teachers involved with bilingual education in my context. All in all, improving the quality of bilingual programs and their long-term sustainability requires effective teacher training plans.

Finally, in this work, I try to ‘attack’ the problem exposed here, proposing a few initiatives. I present a validation process applied to a tool that can help measure the impact that teacher training can depict as we work towards the development and improvement of abilities to work under a CLIL perspective. This strategy which measures the competence to work with CLIL so as to diagnose the academic areas that may require further training. This can also contribute to the development of curricular plans adjusted to the real needs of these teachers and to the reduction of differences at the level of integration of teachers. CLIL methodological principles available to qualified teachers. That is what I envision in this Master’s thesis, a didactic proposal for teachers who are to be joining bilingual programs in the city of Guayaquil, and who need to be familiar with important tenets from current approaches like CLIL.

3.8 CLIL in times of Covid-19 pandemic

There are different applications that allow the creation of communicative spaces: e-mail, conference, chat, videoconferencing, audio conference, shared whiteboard, presentation tools, shared navigation or integrated systems that incorporate different management tools, communication, collaborative work, and content distribution that generate true environments to develop teaching-learning processes. The global health crisis, caused by Covid-19 generated an educational crisis as of March 14, 2020, the date on which all educational centers in the city of Guayaquil and throughout the country were closed. Teachers had to respond to one of the most

significant educational challenges in recent decades, providing very provisional solutions that will leave elements of reflection concerning the adoption of certain innovations.

It is a fact that educational technology has experienced a significant paradigm shift during the global COVID-19 pandemic. Teachers and students have seen the great usefulness of mobile devices and digital tools to continue with the teaching-learning process. These digital tools, widely known as Information and Communication Technologies (ICT), have been essential in this digitalization of teaching, allowing the change of educational contexts, that is, moving from face-to-face teaching to virtual or online instruction. This change in the instruction model has been a great challenge for education professionals, with optimal professional digital competence being essential for the effectiveness of the pedagogical process.

As we know, this shift to full online educational has revealed several gaps teachers and students had to deal with. One of the biggest problems in the virtual modality is the internet connectivity, that is, proper access to internet connections. Another problem is the uncertainty that exists if students are efficiently assimilating the knowledge taught by their teachers through this modality. That is why it must be taken into account that not only must changes be made in the classes that are not yet well-coordinated, but it is also appropriate to create an understandable model for each subject, as indicated by Vera-Muñoz, 2004). Online learning has profoundly modified the role played by teachers and students and has broken up with one of the strongest constants of any educational process, the standardization of teaching, to achieve one of the most difficult challenges in any educational process: the individualization and socialization of teaching and learning at the same time.

On the other hand, because of the Covid-19 pandemic, the use of information and communication technologies has become extremely important in contexts all over the world. In this sense, it has been seen the need to integrate into the teaching processes the use of multiple means in order to transmit to students the planned contents. Considering the way to develop the classes in times of pandemic, I can say that this implies articulating learning and knowledge technologies in order to modulate variables that contribute significantly to classroom teaching. Within this scenario of rapid changes, I see also as important to call attention to the need of establishing how to fully and efficiently make use of ICTs (Into language teaching) and PLEs

(Personal Learning Environment)⁴ so they can contribute to the development of online distance education in institutions at all levels.

According to Hassan et al. (2017), the benefits in the performance of learning foreign languages have been possible thanks to the use of mobile devices, social networks and educational applications and platforms. With that in mind, I believe it is important to make an analysis regarding what Hassan indicates, since, in many cases, depending on each reality, it can be said that technological resources alone cannot guarantee the teaching of teachers and the learning of students.

For this whole process to unfold successfully, teachers should be convinced of the advantages and benefits of technology concerning the improvement of the learning process. This means in many ways that teachers need support and training to integrate ICT into language teaching, as indicated by Aguiar et al. (2019). In this sense, for Duran et al. (2010), students should use technology to improve their language skills because nowadays especially it plays a crucial role in developing their creativity, while providing them with interesting, enjoyable, and exciting alternatives to study language and, of course, contents of different school disciplines.

Within the course of this terrible pandemic, online teaching “has made it possible to relocate and break with the traditional temporal barrier of training processes” (Gabarda Méndez et al, 2019, p. 19). Something that has been key during the confinement caused by the Covid-19 crisis is exactly to adapt face-to-face teaching to a distance methodology. It is clear to me that through this teaching model teachers feel a little unable to apply a CLIL methodology correctly and securely. We can attribute this to the fast way things happened, and, in my view, we can possibly affirm taking into consideration my reality that the current online teaching model has caused students to feel they have either stopped or slowed down significantly in terms of learning outcomes. Despite the fact that teachers here have faced in an innovative way, and even as an ambitious challenge, the possibility of demonstrating that disciplines could be taught during the pandemic with a good dosage of hard work, creativity, motivation and interest, with the resources and training adapted to testing their educational experiences as an example of good teaching practices, overall results in the schools of the city of Guayaquil have shown that these dedicated professionals have not been able to combine satisfactorily in a virtual environment of integration of language and content

⁴ Set of information sources, tools, connections and activities that each person uses to learn from their field of study or their relationship with technology.

in the course of local bilingual settings. In many ways, this has to do with the difficulties related to access and proper use of ICTs both by teachers and students as a whole.

To a great number of people, distance teaching is a real challenge when it comes to learning any type of content, including foreign languages like English FL. However, and thanks to the multiple teaching methodologies and educational technologies, this process along the years has proved to become more effective once adaptation to this new paradigm progresses and stand those involved become aware of the restrictions these virtual environments may pose (Fischer & Rodríguez, 2020).

One significant issue that I believe it is important to raise and that has little to do with technologies themselves related to age of teachers. In Guayaquil, specifically, we face a problem that has become, in my view, some kind of weakness when it comes to moving entirely to online teaching. In the city's secondary schools there are many teachers who are today over 60 years of age and they have had the arduous task of technology management within a very brief period of time. Despite the huge efforts they have been making to adapt to this new reality, we cannot deny that this has become a real challenge since they seem not ready to take advantage of the great possibilities that the use of different technologies can offer them, especially if they are part of faculty who work in CLIL-based programs. Unfortunately, out of my experience, what I have been seeing is a great number of fellow teachers going through that "internal fight" with technology on their part. They have not been able to develop all the potential they surely have due to this experience in handling both language and the curricular content, and one important factor that makes a difference in this process is exactly their professional preparation that while heavily concentrated in face-to-face pedagogies has been shaken up by the challenge of having in no time at all to become familiar with the technological advances of this era in order to teach classes fully online.

The fundamental objective in the pedagogical process when it comes to working with curricular contents and English, while operating in a CLIL methodology, has created the opportunity for teachers to develop a sort of school community in which students can to explore links to achieve meaningful learning through the use of online tools. This has also helped teachers acquire the bases for adequate integration of the CLIL methodology.

At this point of so many challenges and uncertainties, I believe so it is important for our students to restructure their learning, relating their previous knowledge with the new ones,

elaborating their own knowledge, combining knowledge improvement with significant learning. The teacher, of course, is a key figure in this whole process despite the drawbacks he/she might have in terms of updating their skills. They need above all a lot of support from those involved in educational policies. In other words, the teacher needs to develop at this point the ability to reach this student that might be in need of different kinds of knowledge through different pedagogical approaches. With that in mind, that is the goal I have with this *Trabajo of Fin de Master*, to suggest, among others aspects, ways and options for teachers to continue growing in their careers, especially at this moment of crucial changes and demands. My didactic proposal for teacher continuous education moves towards that specific direction.

3.9 Meaningful learning and CLIL

Ausubel (1976 cited in Rodríguez, 2004) argues that ~~the~~ any new knowledge acquired by students does not automatically add to the already existing knowledge, but it does establish important relationships with the knowledge that learners possess, producing its reorganization. Therefore, learning is based on establishing a connection between new and previous learning, giving rise to new meanings. In fact, new knowledge modifies and reconfigures all the previous knowledge students hold.

This is what I would call meaningful learning, which is based on the process of relating new knowledge or information to cognitive structures. This combination is not simple, but in this process, the new knowledge students have access to acquires a different meaning for them to the give rise to a transformation of the cognitive structure, turning out to be a more stable and distinguished knowledge. This learning outcome is based both on the process and the product. This is how the idea of meaningful learning is very significant, especially in a CLIL context. I do rely on this orientation as I elaborate on the didactic proposal. The purpose is to study the training teachers of the different subjects need to engage in, while getting familiar with an integrated and interdisciplinary learning which puts together the content of curricular disciplines and the foreign language of instruction (English).

All in all, for a meaningful learning process to happen in CLIL-based programs in educational contexts like the ones in the city of Guayaquil, I insist on the importance of proper and meaningful teacher training, especially at this moment when our teachers are compelled to move to the digital world to continue with their work of educating students both in content and language. Having said that, and after having brought a little of the theoretical and contextual background, I

move on in the next chapter to the explication and discussion of the didactic proposal for teachers working in primary and secondary schools in the city's basic education system.

4. THE DIDACTIC PROPOSAL

4.1 Justification

The idea for this didactical proposal came about due to some factors. First of all, because of the COVID-19 pandemic that broke out at the beginning of 2020, and that for sure affected the educational scenario in our local secondary schools. As in many similar contexts like the one where I live and work, our educational setting has suffered resounding changes in the daily activities of teachers, especially concerning requirements and demands related to remote or teleworking activities with the objective of implementing various changes in their strategies in order to keep the teaching-learning process moving on effectively.

Needless to say that adaptation was a key element in this whole process. Adaptation to a context in which students and teachers have been directly affected by the repercussions of the pandemic in their daily lives. This is how the idea of this proposal was born. It came out of my observations of a couple of virtual class of the 10th grade in an Ecuadorian bilingual school. By analyzing the data recorded on video, it became clearly evidenced that the fellow teacher who kindly let me have access to her classes had difficulties in fostering interactions among students when attempting to adequately combine the teaching the content of a class and the teaching of the foreign language of instruction, in this case, English. Due to these difficulties and despite all the efforts made by the teacher, they situation go to the point that the students seemed to have lost interest in both content and language learning, especially when comparing to the lessons taught face-to-face. Because of this whole situation and thinking that we should not blame teachers for gaps which are normally caused by the entire system in which they are immersed, I thought that it would be very interesting to devise as a final work of my MIEB course a didactic proposal that could provide insights to help teachers operating in CLIL contexts during the pandemic, presenting to them ways to improve and develop their pedagogical skills.

4.2 Contextualization

As previously mentioned, this proposal was designed to be developed in a regular schools located in the city of Guayaquil, Ecuador, encompassing different teaching scenarios. As a regular teacher and researcher, through observation I could detect some shortcomings on the part of teachers that could be in many ways approached with teacher training. By thinking of them, I

concluded that in order to reach a better performance, we could work on a short proposal that would be based on tasks.

To achieve the aforementioned, I see as necessary that teachers in their self-preparation, among other aspects, take into consideration the profile of their group of students, envisioning that they, the teachers, have to be prepared to achieve the knowledge, skills, actions, procedures, norms that allow them to determine the nodes of integration that exists between the curricular contents and the foreign language. All of which is contemplated in the integrated disciplines, and based on them, the contradictions inherent to the contents are raised with the aim of developing teaching tasks that can have a positive impact in their teaching practice.

In a nutshell, this proposal involving teachers aims to introduce a series of tasks designed to improve and develop teachers' skills when it comes to taking part in CLIL-based program. The tasks, of course, are to be used in class with their students, but having access to them and getting to know about the Task-based approach can surely create what we would call a "washback effect". In other words, by knowing previously how to organize their teaching as a series of tasks they learn. So, in the next sections I will briefly approach some fundamental tenets from the Task-based approach and then introduce the tasks that, in my view, can help practitioners improve the quality of their CLIL-based classes as they implement such tasks.

When designing materials, it is important to consider two types of principles: the theoretical principles that are related to the theories of language and language learning that will be taken into account in the design of the material, and the methodological principles that are essentially related to defining the most appropriate curricular content to the context, considering the requirements on the part of teachers, students and the institution.

In the specific case of Task-based language teaching, my proposal in this work, it all starts from the disciplinary contents that have to contribute to the implementation of communicative situations. For a common theme, concepts or words are sought relating them to the knowledge from the different disciplines that comprise the Basic Sciences cycle. At the same time, it emphasizes the local context and the need to use the foreign language in a non-native environment, in which students fundamentally need that specific FL to interact with in the academic community. In this sense, the contents are inserted in a broader framework that allows them to be integrated in spaces superior to those offered by a single discipline.

4.3 Implementing the task-based proposal

The instructional context I am going to describe here refers to the discipline Science taught in local 10th grade of our secondary education. In the aforementioned observation of some virtual classes, I could notice that the activities were being carried out sort of mechanically and that the students were demotivated as they were facing new teaching situations in which the planned activities, in my view, showed to lack the proper orientation and stimulus to involve students in independent cognitive practice. In other words, it was the crude example of passive transmission of knowledge with very little reflection on the part of students. Besides that, I could realize that the proper environment for students themselves spontaneously in the target language was not being fostered. They commonly depended on teacher intervention in order to manifest or say something. Faced with this situation, the development of a series of tasks is proposed to strengthen the development of teaching skills and independent and structured work. This is specified through the elaboration of tasks that will be varied and differentiated, taking into account the needs and potentialities that stimulate the cognitive development of the student and thus promote the improvement of teaching skills. As stated, by engaging in tasks to teach content and language, teachers become learners.

In the teaching-learning process, the task series that I propose depicts some specific features such as a close link between theory and practice and a practical-experimental and interdisciplinary assumption. In this process, the teacher must consider the level of depth (level of familiarization, reproduction, production, and creation) when studying a given content in order to specify this analysis. In addition, the teacher also needs to enforce his/her planning and control skills for which he/she must:

a. Develop the ability to design tasks in his/her class taking into account the individual characteristics of his/her students, considering the levels learners might be at like low level of assimilation, average level, high performance, talent, etc.

b. Develop the ability to structure the tasks using the potential of different resources such as educational software (TICs), textbooks, among others. These will be used in correspondence with the language and content objectives for the assimilation of knowledge in a reflective and productive way;

c. Get students to understand the objective of the proposed series of tasks;

d. Explain clearly and precisely all the procedures and guide students towards the full achievement of satisfactory results.

Another important element that should be taken into account are the qualifications of the language teacher that are described below:

- Pedagogical competence, knowledge and mastery of teaching and learning skills, knowledge of the content;

- Methodological competence, management of the didactic process in L2 (planning, organization, control) according to the potential and aptitudes of the students;

- Academic competence, knowledge of the language of instruction, content, mastery of teaching strategies;

- Communicative competence, accuracy and fluency, knowledge of L2 culture(s), registers, and intonation patterns;

- Familiarity with design of adopted teaching materials, handling of technical means, texts, materials adapted to the classroom.

4.4 Series of tasks for a CLIL-based lesson

For this proposal of a series of 10 tasks to be implemented in a CLIL-based program, I have selected a topic from the discipline Science taught in the 10th grade. This is Unit 1 from the book “Science Fusion volume 1” by Houghton Mifflin Harcourt. (Appendix A). The title of the unit “Living things environment and reproduction” and the whole content is to be covered in 10 weeks. That is why I have planned a series of 10 tasks. The present curriculum surely bases itself on CLIL, thus it includes the 4Cs (culture, cognition, communication, and content), as reinforced below:

Content: The progression of knowledge (knowing) procedures (Meyer, 2010). attitudes (knowing how to be) that lead to the formation of skills. It includes analyzing the contents of curricular subjects presented understandably.

Communication: Use of the language to learn (content) and at the same time learn to use the language (language). In L2, the study of curricular subjects encompasses subject knowledge and language skills in an integrated way. It includes from the use of the language in social situations and lexicon of general use or better known as BICS (Basic Integrated Communication Skills); up to the required level in academic environments with specialized vocabulary corresponding to this field or CALP (Cognitive Academic Language Proficiency).

Cognition: The development of cognitive abilities for the construction of concepts and linguistic manifestation. These skills include the use of reasoning and thinking, which include lower-order cognitive skills LOTS (Lower Order Thinking Skills), and higher-order HOTS (Higher Order Thinking Skills)

Culture: Knowledge, skills, and attitudes that are part of intercultural competence raise awareness of one's own identity and that of others. Understands cooperative learning, respect for others, teamwork.

Concerning the series of tasks to be presented, I list below both Content and Language

Objectives: The content objectives are found in the study plan (Appendix B) and are also found in each of the tasks developed

Content objectives

- Students can describe the characteristics of cells;
- Students can understand the complex structure of each kind of cells;
- Students can understand the structure and organization of living matter;
- Students can understand the importance of reproduction for the survival of species;
- Students can recognize poriferous characteristics;
- Students can argue the importance of poriferous;
- Students can define the coelenterates based on their essential characteristics;
- Students can characterize the animals with bilateral symmetry;
- Students can explain the damages that flatworms cause to man and other animals;
- Students can identify the relationship between humans and other living things.

Language objectives

- Students use and understand vocabulary from the text;
- Students can identify the names of cell types;
- Students can take notes and spell correctly;
- Students can understand questions and answer;
- Students can summarize, answer and ask questions related to the topic;
- Students can start forums (discussion groups) and debate with classmates;
- Students explain characteristics orally and in writing;
- Students can express their opinion about the importance of the topic;
- Students can describe flatworms with their words;

- Students organize an exhibition on the topic.

In the sequence, listed below we have the General Contents and the Content related to language skills:

General contents

- Living's things and environment;
- Types of cells: Prokaryotes and Eukaryotes (protist);
- Fungi and plants;
- Reproduction function of organisms.
- Poriferous: (sponges) animals of less complexity;
- The poriferous. Importance;
- The coelenterates. Essential features;
- Bilateral symmetry;
- The Flatworms (Platyhelminthes);
- Pathogens and diseases.

Content related to language skills

- Academic vocabulary related to the topic;
- Vocabulary to describe qualities and characteristics;
- Understanding of oral content;
- Oral production, group discussions, presentations on the subject;
- Production of written texts, summaries, note-taking;
- Correct writing of academic vocabulary.

After presenting the content of the chosen Unit (see some pages of the textbook in the Appendix), both in terms of content and language, I will then present and explain steps and elements of the series of tasks that go as a suggestion to help our teachers develop their skills towards engaging students in this learning process. As defended earlier, I see that this series of tasks can be fully used as part of teacher training programs in contexts like the one described here and where I work. In other words, by learning how diversify and strengthen the way we teach we enforce our potential as a teacher but also as a learner, especially at this moment when we are going under moments of drastic changes and having to face all kinds of challenges both inside and outside our classrooms.

Task # 1

Title: Living's things and environment

Purpose: Expand knowledge about living beings developing investigative skills for interactive and communicative relationships.

Individual Task: Taxonomy classification.

Objective: Describe characteristics of cells.

Skills: Investigate and explain the importance of living beings, infer their importance for the life on earth.

Anticipation: Introduce students to the content

Activities

- Observe images on the projector (Appendix C).
- Open with essential questions:
- What do the images have in common?
- Characteristics and parts of cells: (cytoplasm, organelles, genetic material)
- Explore from investigation the level of complexity of living thing
- Introduce academic vocabulary

Vocabulary:

Cells, plasma, membrane, cytoplasm, DNA, ribosomes

Conclusions:

- Taxonomic classification containing groups according to:
species, genus, family.

Observation: Evaluate the performance of students in the taxonomic classification of living things.

Materials: Science book, wifi signal, web pages, projector, computer, blackboard

Task # 2

Title: Types of cells: Prokaryotes and Eukaryotes (protist)

Purpose: Expand the knowledge that students about types of cells, their reproduction and the constitution of tissues.

Individual Task: Recognize the characteristics of the types of cells.

Objective: Understand the complex structure of each kind of cells

Skills: Recognize the types of cells

Anticipation:

-Observe images in the book page, 122 (Appendix D)

-Build background

Activities:

-Introduce academic vocabulary with the help of visual aids (flashcards):

-Explain:

Cells without a nucleus are prokaryotic cells, they are classified into two groups: bacteria and archaea.

Larger cells are eukaryotic, they have a nucleus. All living things, that are not bacteria or archaea, are made up of one or more eukaryotic cells.

-How can observe cells? Observe using a microscope

-Take notes about their characteristics.

Vocabulary:

Prokaryotic, eukaryotic, archaea, organelles, yeasts, amoebas

Conclusions: Compare and identify prokaryotic cells and eukaryotic cells.

Consolidation: Measure the ability to distinguish between cell types.

Materials: Science Fusion book volume 1, flashcards, microscope, blackboard, worksheet. (Appendix E).

Task # 3

Title: Fungi and plants

Purpose: Analyze the level of complexity of living matter and organism.

Individual Task: Recognize the properties each organism.

Objective: Understand the structure and organization of living matter.

Skills: Identify level of organization of living matter

Activities

-Anticipation: Read page 130 in the book connecting information with students' prior knowledge. (Appendix F).

- Fungi are closely related to animals than plants

- They are heterotroph

- They can be sexually, asexually or both.

- Fungi interact with other organisms forming beneficial associations.

-Introduce academic vocabulary with the help of visual aids

-Investigate on the internet about fungi reproduction and life cycle.

Take notes about their characteristics.

- Discussion: Ask for information:

- How do fungi reproduce? Sexual and asexual reproduction

- What they produce during reproduction?

Vocabulary:

Spore, asexual, lichen, heterotrophic

Conclusions:

Analyze the properties and level of organization of living matters and organism.

Consolidation: the research in class will be evaluated through questions in worksheets

Materials: Science Fusion book volume 1, flashcards, blackboard, worksheet, (Appendix G) wifi signal, projector.

Task # 4

Title: Reproduction function of organisms

Purpose: differentiate sexual and asexual reproduction in organisms

Grupal Task: Explain the types of reproduction according to the different organisms (Appendix H).

Objective: Understand the importance of reproduction for survival of species.

Skills: Describe sexual reproduction in living beings

Activities

- Anticipation: Watch a video about reproduction organisms. (Brainstorm)
- Take notes
- Explain: Single celled organism reproduction (sexual, asexual, simple division)
 - Multicellular organism reproduction (sexual, asexual)
 - Invertebrates' reproduction
 - . Life-cycle reproduction
- Introduce academic vocabulary with the information on video.
- Ask for information:
 - How a single cell organism reproduces?
 - How a multicellular-organism reproduces?
- Explain the life-cycle reproduction.
- Worksheet (Appendix H)

Vocabulary:

Fertilized, zygote, ciliate, gamete, chromosome, rhizome

Conclusions:

Analyze the properties and level of organization of living matters and organism.

Consolidation: The research in class will be evaluated through questions in worksheets

Materials: Science Fusion book volume 1, informative video, blackboard, wifi signal, projector.

Task #5

Title: Poriferous: (sponges) animals of less complexity.

Purpose: To expand the knowledge that students have about the animal kingdom by recognizing traits that distinguish poriferous animals as less complex animals.

Individual task: Poriferous animals of less complexity.

Group task: Summary of the features that distinguish porifers as less complex animals.

Objective: To recognize poriferous characteristics, according to their essential features and their level of complexity.

Skill: Recognize poriferous as organisms of less complexity

Activities

- Anticipation: Read the book pg. 176. (Connecting with prior knowledge)
- Summarize the topic read and answer the questions.
- What characteristics include poriferous within the animal kingdom?
- What distinguishes the poriferous as those of less complexity?
- Sponges are animals considered to be of the lowest level of organization.
- How do you provide food if you cannot move?
- Introduce academic vocabulary
- Worksheet (Appendix I)

Vocabulary: Poriferous, tissues, flagella, collagen,

Conclusions: They will be evidenced from a summary.

Consolidation: Evaluated from a written question. Self-assessment of the planned task.

Materials: Science Fusion Vol. 1 page 176, worksheet,

Task # 6

Title: The poriferous. Importance.

Purpose: Recognize the importance of animals in the life of man, their usefulness in the economy, health and food.

Individual task: Investigate the importance of porifers using the textbook

Common task: Class discussion about the importance of porifers.

Objective: To argue the importance of poriferous.

Activities

- Read in the textbook page 178. (Appendix J)
- Look for the meaning of biological indicators.
- Importance of sponges in relation to:
 - Biological indicators:
 - Reef Renovators.
 - . Pharmaceutical industry.
 - . Nutrition of other organisms.
 - Aesthetic and commercial use
- Introduce academic vocabulary

Vocabulary:

Bioactive, symbionts, ecosystems

Conclusions:

- Are they really poriferous animals? Justify your answer.
- What is the importance of sponges for nature?

Observation: The abilities of the students will be evaluated to summarize the information.

Materials: Science Fusion Vol. 1 pg. 178,

Task # 7

Title: The coelenterates. Essential features

Organizational form: Individual.

Purpose: Appreciate the diversity of the animal kingdom

Individual task: Characterize the coelenterates from an independent study.

Objective: To define the coelenterates based on their essential characteristics to maintain a scientific conception of the world.

Skills: Explain essential characteristics of coelenterates

Activities

Anticipation: Introduce students to the topic

-Watch the video: Animals with radial symmetry, coelenterates. (Appendix K)

Essential features.

- Concept of the term coelenterates.
- Types and function of cells that make up the coelenterates body.
- Symmetry of the coelenterates What does
- Shape of the coelenterates.
- Summarize the essential characteristics of these organisms.
- Worksheet (Appendix K)

Vocabulary:

-phagocytosis, polyps, hypostome

Conclusions:

-Summarize: Why are coelenterates superior to poriferous?

Consolidation: Evaluate students' abilities in expressing critical thinking.

Materials: “Coelenterate essentials” video, projector, whiteboard, worksheet

Task # 8

Title: Bilateral symmetry.

Organizational form: By team.

Purpose: To identify the animals with bilateral symmetry showing the advantages of this type of symmetry.

Individual task: Define bilateral symmetry and its advantages.

Common task: Exemplify animals with this type of symmetry

Objective: To characterize the animals with bilateral symmetry, showing the advantages of this type of symmetry.

Activities

-Anticipation: Review and explanation about bilateral symmetry, take notes.

-Research on the internet: (Appendix L)

What are the essential characteristics of bilateral symmetry animals?

What are the advantages of bilateral symmetry animals?

Vocabulary:

Triploblastic, unsegmented, acoelomate, regenerative

Conclusions:

It exemplifies animals that present this type of symmetry, represented by a graph.

Through notes.

What type of symmetry does the starfish present in adulthood?

Consolidation:

-Opinion on the importance of bilateral symmetry from an evolutionary point of view.

Materials:

Internet, electronic devices, written material, blackboard, school supplies.

Tasks #9

Title: The Flatworms (Platyhelminthes)

Organizational form: Individual.

Purpose: To know the negative effects caused by parasitic flatworms, measures to avoid infestation, and other diseases that can become epidemics.

Individual task: The relationship negative effects, parasitism, hygiene measures.

Common task: Summarize species of flatworms that cause harm to man and the measures that should be put into practice.

Objective: Explain the damages that flatworms cause to man and other animals, measures to avoid them.

Skills: Understand the negative effects of parasitism

-Anticipation: Essential questions about Prezi presentation about flatworms

Activities

- Types of flatworms

-Taxonomic classification: - Turbellaria –Trematode - Cestoda

-Read in the text: (Appendix M).

-Does it explain why flatworms are considered platyhelminthes?

-Cite examples of parasitic flatworms that affect human health and other animals.

-Develop a taxonomic classification of parasite species, their habitat, the damage they cause and measures to avoid their infestation.

Vocabulary: worm, parasite

Conclusions: Reflect and review the damage that flatworms cause to man and the hygienic measures to avoid their infestation.

Consolidation: Investigate What is the pseudocoelom?

Materials: Projector, computer, blackboard, Science Fusion Vol. 1 pg. 180

Task # 10

Title: Pathogens and diseases

Organizational form: Individual.

Purpose: Propose measures to prevent the spread of diseases caused by pathogens

Individual task: Research the types of transmission.

Objective: Identify the relationship between humans and other living things that can affect health.

Skills: Describe preventing measures.

Anticipation: Essential questions to introduce the student to the subject.

Activities: (Construction)

- Read and underline in Science Fusion textbook pg. 168 (Appendix N).
- The characteristics of the pathogens.
- Take notes
- Identify the classes of immune barriers
- Types of immunity present in humans. (Appendix O).
- Propose 4 hygienic measures that we must practice to avoid parasitism
- Group discussion
- Organize exhibition on: "Damage caused by parasites".

Vocabulary:

Pathogens, viruses, parasitism, immunological

Conclusions:

Make a summary with information obtained

Consolidation

Investigate other human pathogens.

Materials: Science Fusion textbook pg. 168, blackboard, internet, electronic devices, school supplies.

4.5 Evaluation

As it has already been mentioned, in the local environment, the sources for teaching both language and content are scarce, and, for this reason, teachers feel the need to both develop their materials or adapt them from existing ones. To achieve this objective, they are stimulated to seriously engage in the continuous development of their methodological, pedagogical, academic, and communicative competences in order to comply with the complexities of today's teaching-learning process. Seen in this way, in my view, teachers must show their abilities both inside and outside the classroom by understanding and applying teaching methodologies, developing content in a didactic way, thus consolidating and strengthening their skills in the management of both content and language.

Regarding the activities proposed in the task-based series developed as a proposal in order to help teachers improve the quality of their skills and the classes, I believe it is also important to invest in a type of continuous formative evaluation. This can be materialized through regular classroom observation (especially peer observation) and through monitoring strategies during the development of the classes and activities. In the case of the task's series proposed here, I would suggest, for instance, the use of the chart which follows for them to assess and reflect over students' performance in oral and linguistic production, content learning, group work, and rubric-based collaboration. Rubrics like this can be shared with students and at the same time inform teachers what aspects their classes proved to be successful and which ones need to be improved.

Competence in linguistic communication				
CRITERIA	10-9	8-7	6-5	4-1
Adequate use of vocabulary	Proper use of vocabulary including some well-defined words	Use of appropriate vocabulary including 2 - 3 well-defined new words	Appropriate use of vocabulary does not include new words.	Use words that are not well understood by the audience.
Identify important information, main ideas with critical thinking.	Student identifies main ideas without visual AIDS's.	Student identifies main ideas with the help of the material provided.	Student identifies only a few main ideas with the help of the material provided.	Student cannot identify main ideas accurately
Collaborative work, with problem solving skills	Always listen, share ideas, support peer efforts. He / she feels comfortable working as a team.	Usually listens, shares ideas, often supports peer efforts. He /She usually works in a team.	Sometimes he/she listens and shares ideas, occasionally supports peer effort. Sometimes he/she is not good at teamwork.	He/she rarely listens and shares ideas, often does not show support for peers. He/she does not like working in teams.
Show autonomy in solving tasks, with initiative in decision-making.	She always performs activities autonomously without help, actively suggests ideas within collaborative work.	Usually performs activities independently, rarely needs help. Usually gives suggestions within collaborative work.	Sometimes they carry out activities independently, they usually need help. Rarely suggests ideas in collaborative work.	Rarely demonstrates autonomy in performing activities, usually needs help. Avoid suggesting ideas in collaborative work.

CHART 1 – Sample of assessment rubric for students in CLIL-based programs⁵

⁵ Table created by Rosa Hernández Magallanes, for the purpose of this pedagogical proposal.

5. CONCLUSION

As I get to end of this final work, I hope I have succeeded in presenting a proposal that, in many ways, can hold some potential to help my fellow teachers in the context where I live and work. The first part of this Master's thesis sought to briefly discuss the theoretical foundations attributed to CLIL. Then I moved on to show that through a didactical proposal for teaching content and language in a specific grade of the secondary education in the city of Guayaquil, Ecuador, it can serve both as a tool to improve the quality of the classes, but especially as a means for the improvement of teachers' skills and competencies. My proposal was designed as a series of tasks involving one unit taken from a specific textbook adopted by schools which have bilingual programs in my home city. After that, I enforced the importance of evaluating students' response to the different tasks having in mind that their performance would serve as a point of departure in order to have teachers engage in a virtuous cycle of reflecting over what went well and what needs to be rethought and the redesigned to be applied once again. That is, teaching working fully as learning for the practitioner. Teaching being always taken as a rich and meaningful learning experience.

In short, I do understand the limitations of this brief work and how far I might be from solving all the problems that I know my fellow teachers and teachers all over the world have to deal with every single day in their routines. The Covid-19 pandemic affected us in different ways, but in some places where educational conditions were already problematic, the consequences were amplified, especially when it came to have the entire already fragile system move in no time all from face-to-face to online delivery and interaction. It was not easy at all, and as teacher, I could not help but address issues like these that affected us deeply. To build up this proposal was not easy, but despite the gaps that I know it brings, the simple exercise of joining forces with my colleagues to envision adaptation and reflection over the intricacies of our educational system has already given me the great sensation that, yes, it was really worth putting all the effort needed to promote change. Even if it is a small change, this will make me very happy.

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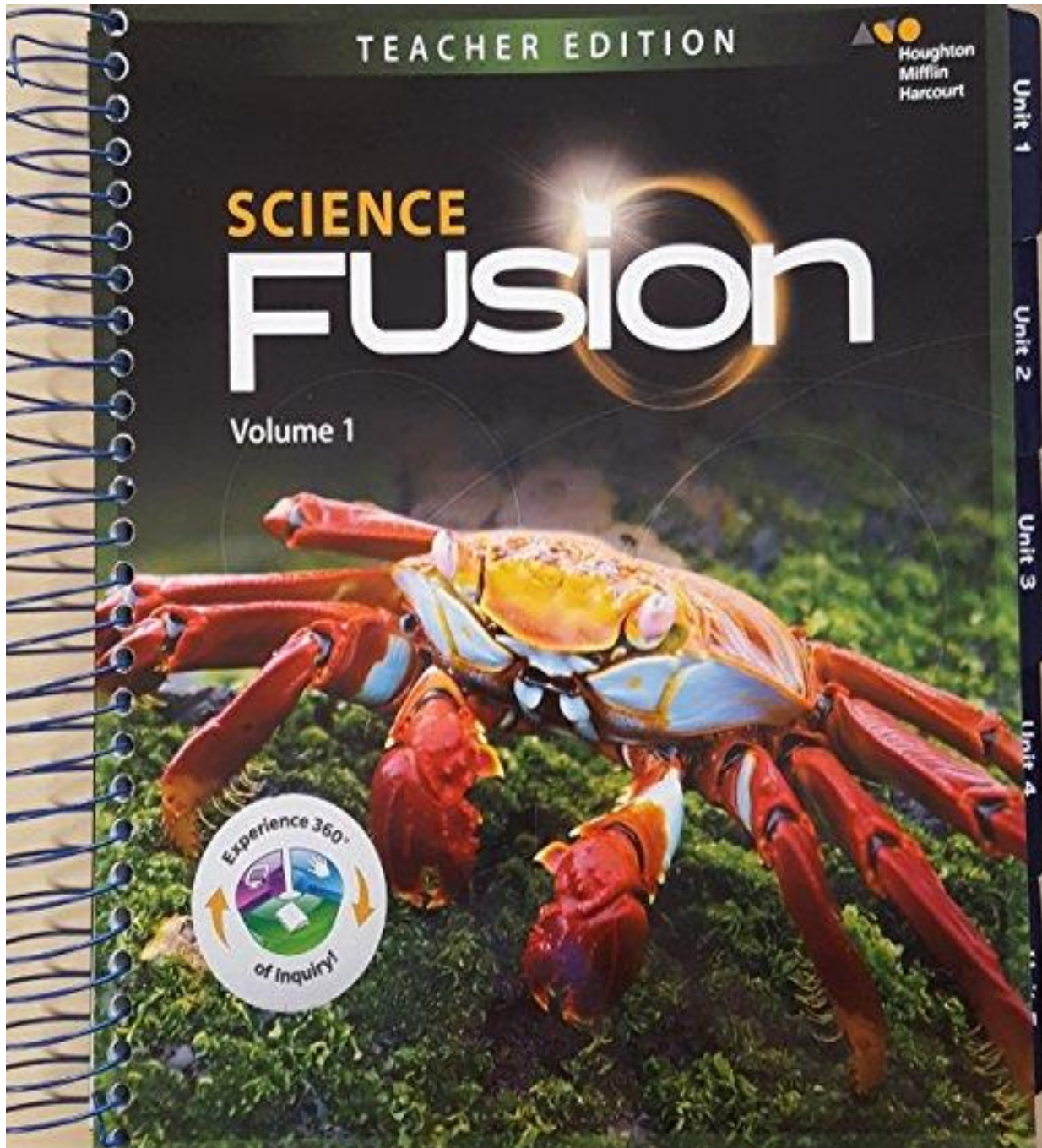
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7. APPENDICES

7.1 Appendix A



7.2 Appendix B

ANNUAL PLAN SCHOOL YEAR 2021 - 2022

1. INFORMATIONAL DATA:					
Área:	Foreign Language			Subject:	Science
Teacher(s):					
Grade/course:	10th	Education Level:	Básica	10th	Sub Level:
2. TIME					
Class periods per week	No. of working weeks	Assessment and incidentals	Total class weeks		Total class periods
2	40	4	36		72
3. GENERAL OBJECTIVES					
Objectives of the area		Objectives of the grade/course			
OG.CN.1. Develop scientific thinking skills in order to achieve intellectual flexibility, inquiring spirit, and critical thinking; demonstrate curiosity to explore the environment around them and value nature as a result of understanding the interactions between living things and the physical environment. OG.CN.2. Understand the point of view of science on the nature of living beings, their diversity, interrelationships, and evolution; on the Earth, its changes and its place in the universe, and on the physical and chemical processes that take place in matter. OG.CN.3. Integrate the concepts of biological, chemical, physical, geological, and astronomical sciences to understand science, technology, and society, linked to the ability to invent, innovate, and provide solutions to the socio-environmental crisis. OG.CN.4. Recognize and value the contributions of science to understand the basic aspects of the structure and functioning of your body, in order to apply measures to promote, protect, and prevent comprehensive health. OG.CN.5. Solve science problems using the scientific method, starting from the identification of problems, the critical search for information, the elaboration of conjectures, the design of experimental activities, the analysis, and communication of reliable and ethical results. OG.CN.6. Use information and communication technologies (ICT) as tools for the critical search for information, analysis, and communication of		O.CN.4.1. Describe the types and characteristics of cells, the cell cycle, the mechanisms of cell reproduction, and the constitution of tissues, which allow us to understand the complex structure and levels of organization of living matter. O.CN.4.2. Describe asexual and sexual reproduction in living things and deduce its importance for the survival and diversity of species. O.CN.4.3. Design representative models of energy flow in food chains and networks, identify the impacts of human activity on ecosystems, and interpret the main threats. O.CN.4.4. Describe the stages of human reproduction as fundamental aspects to understand fertilization, implantation, embryo development, and birth, and analyze the importance of prenatal nutrition and lactation. O.CN.4.5. Identify the main relationships between humans and other living things that affect their health, how to control infections through natural and artificial immune barriers. O.CN.4.6. Experimentally investigate the change in position and speed of objects by the action of a force, their stability or instability, and the effects of gravitational force. O.CN.4.7. Analyze organic and inorganic matter, establish their similarities and differences according to their properties, and identify carbon as a constituent element of biomolecules (carbohydrates, proteins, lipids, and nucleic acids). O.CN.4.8. Investigate in documentary form the structure and composition of the universe; geological and paleontological evidence on Earth changes and the effect of biogeochemical cycles on the natural environment. All in order to predict the impact of human activities and			

their experiences and conclusions about natural and social phenomena and events. OG.CN.7. Properly use oral and written language, as well as other systems of notation and representation, when required. OG.CN.8. Communicate scientific information, results, and conclusions of their inquiries to different interlocutors, through various techniques and resources, critical and reflective argumentation and justification with evidence and evidence. OG.CN.9. Understand and value ancestral knowledge and the history of scientific, technological, and cultural development considering the action they exert on personal and social life. OG.CN.10. Appreciate the importance of scientific training, the values, and attitudes typical of scientific thought, and adopt a critical and grounded attitude in the face of the great problems that relations between science and society pose today.	interpret the consequences of climate change and global warming. O.CN.4.9. Understand the connection between science and the real problems of the world as a process of scientific literacy to achieve, in the students, the interest in science, technology, and society. O.CN.4.10. Use the scientific method to develop scientific research skills that promote critical, reflective, and creative thinking focused on problem-solving.
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4. VALUES OF THE EXIT PROFILE THAT ARE DEVELOPED IN THE GRADE/COURSE:

5. DEVELOPMENT OF PLANNING UNITS

Name of unit 1: _____		Living things and their environment		Time in weeks:	9
Specific objectives of the planning unit	Skills	Contents	Methodological orientation	Evaluation (indicators)	
O.CN.4.1. Describe the types and characteristics of cells, the cell cycle, the mechanisms of cell reproduction, and the constitution of tissues, which allow us to understand the complex structure and levels of organization of living matter. O.CN.4.9. Understand the connection between science and the real problems of the world as a process of scientific literacy to achieve, in the students, the	CN.4.1.1 Investigate and explain the properties of living beings and infer its importance for the maintenance of the life on Earth. CN.4.1.2 Explore and identify levels of organization of living matter, according to the level of complexity. CN.4.1.7 Analyze the levels of organization and diversity of living things, and classify them into taxonomic groups, according to the characteristics observed with the naked eye and those invisible to the human eye.	Taxonomic classification Systematic and classification of species Classification of prokaryotes and protist Classification of fungi and plants Classification of animals	Anticipation Open with essential questions Introduce students to the content objective. Ask for ss opinion about the pictures on the book. Build background Introduce academic vocabulary Create connections with the prior knowledge. Construction Organize information by graphics Class discussions	CE.CN.4.1. Explains, from the investigation and exploration, the level of complexity of living beings, from the analysis of their properties, levels of organization, diversity and the classification of given taxonomic groups. I.CN.4.1.1. Analyze the level of complexity of living matter and organisms, depending on their properties and levels the organisation. (J.3.) I.CN.4.1.2. It classifies living beings according to given taxonomic criteria (domain and kingdom) and establishes a relationship between the taxonomic group and the levels of organization it presents and its diversity. (J.3., I.2.)	

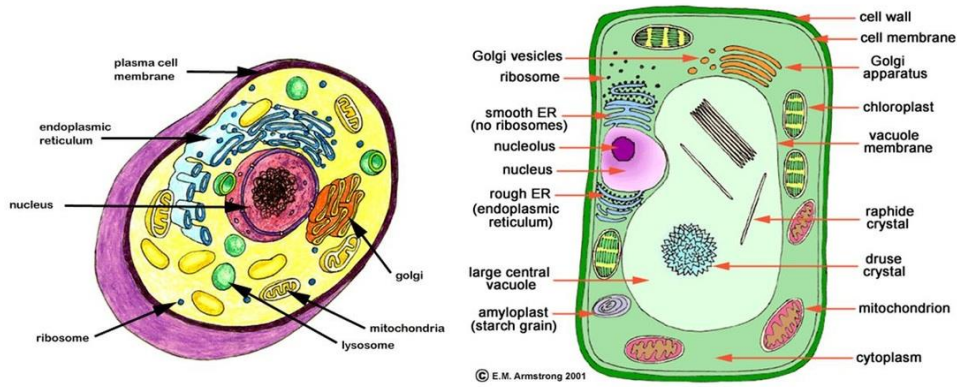
interest in science, technology, and society.			Underline essential information Pair discussion Answer questions Ask questions about the text Group work Organize expositions about the topics Brainstorm ideas Order events or processes Consolidation Summarize the class (oral or written)	
Name of unit 1: _____	Living beings reproduction		Time in weeks:	9
Specific objectives of the planning unit	Skills	Contents	Methodological orientation	Evaluación (indicadores)
O.CN.4.2. Describe asexual and sexual reproduction in living things and deduce its importance for the survival and diversity of species. O.CN.4.9. Understand the connection between science and the real problems of the world as a process of scientific literacy to achieve, in the students, the interest in science, technology, and society.	CN.4.1.6. Analyze the cell cycle process and experimentally investigate mitotic and meiotic cell cycles, describe them and establish their importance in cell proliferation and gamete formation. CN.4.1.8. Use models and describe sexual reproduction in living beings and deduce its importance for the survival of species. CN.4.1.9. Use models and describe asexual reproduction in living things, identify their types and deduce their importance for the survival of the species.	Reproduction function Cellular reproduction Reproduction mechanisms Reproduction in: bacteria, protist, fungi, plants. Reproduction in invertebrates Reproduction in vertebrates	Anticipation Open with essential questions Introduce students to the content objective. Ask for ss opinion about the pictures on the book. Build background Introduce academic vocabulary Create connections with the prior knowledge. Construction Organize information by graphics Class discussions Underline essential information Pair discussion Answer questions Ask questions about the text	CE.CN.4.2. It exemplifies the complexity of living things (animals and plants) from the differentiation of cells and tissues that make them up, the importance of the cell cycle they develop, the types of reproduction they perform, and identifies the contribution of technology to the development of The science. I.CN.4.2.3. Explains the cell cycle, its importance for the formation of animal tissues, plant tissues and gametes. (J3, I2) I.CN.4.2.4. It differentiates sexual from asexual reproduction and determines the importance for the survival of different species. (J.3., S.1.)

			Group work Organize expositions about the topics Brainstorm ideas Order events or processes Consolidation Summarize the class (oral or written)	
RESOURCES			BIBLIOGRAPHY	
Computer, internet connection, digital resources.			National Science Curriculum 2016 https://educacion.gob.ec/wp-content/uploads/downloads/2016/08/4-CCNN.pdf	
8. OBSERVATIONS				
9. RESPONSIBILITY SIGNATURES				
MADE BY		CHECKED BY		APPROVED BY
TEACHER(S):		NAME:		NAME:
Signature:		Signature:		Signature:
Date: 05/05/2021				

7.3 Appendix C

Task # 1: material shown in class

- All organisms are made of **cells**

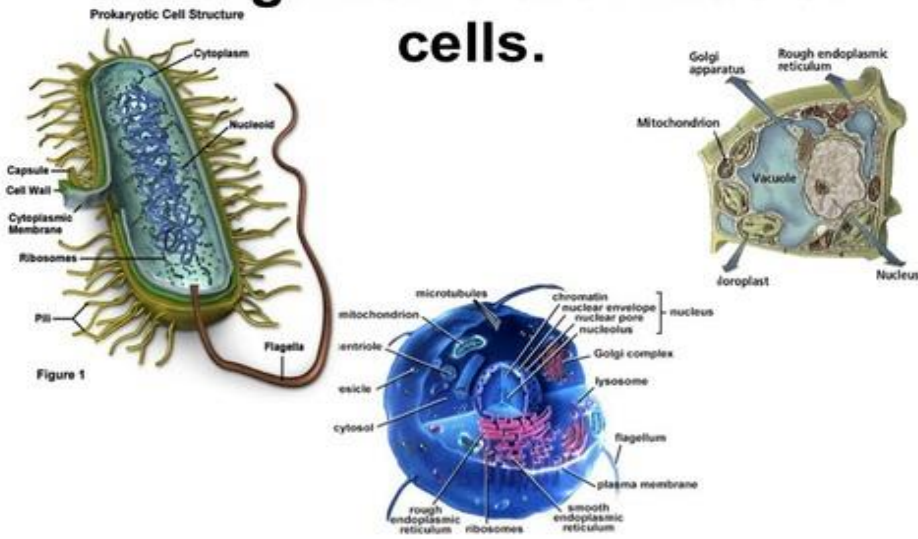


Animal cell

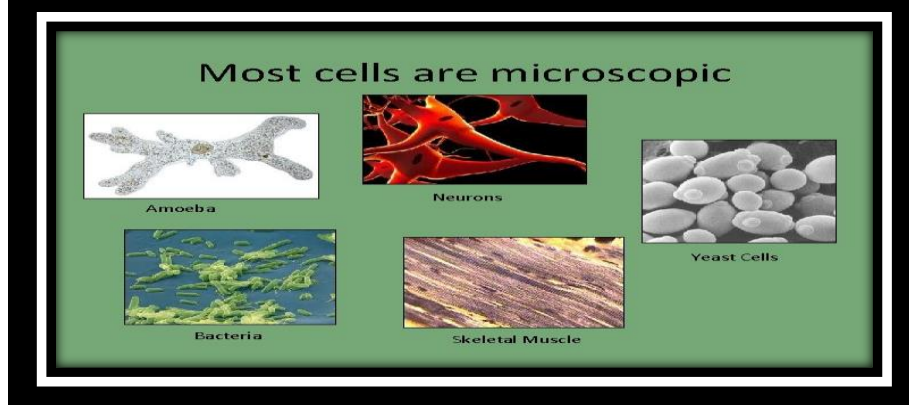
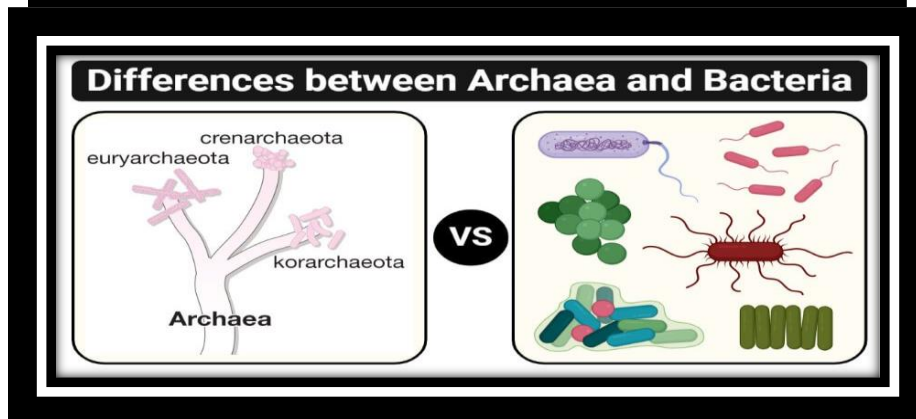
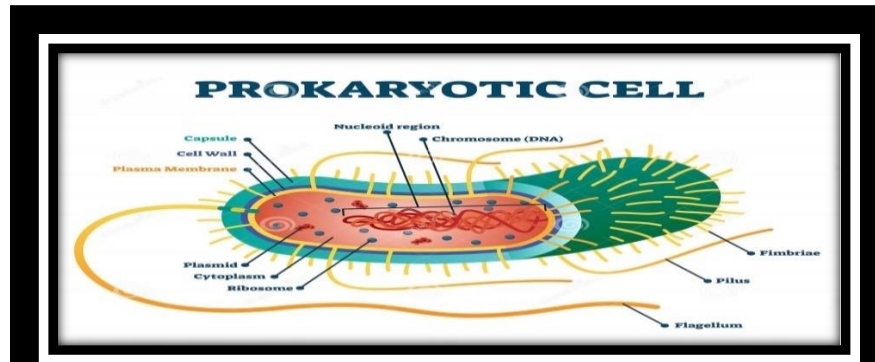
Plant cell

- 1.
- 2.

All organisms are made of cells.



7.4 Appendix D



7.5 Appendix E

WORKSHEET

Classify in the following table, the characteristics of prokaryotic and eukaryotic cells.

- | | |
|-------------------------------------|--|
| -Unicellular organism | - Smaller (0.1-5 μm) |
| -Have a nucleus | - Simple cells |
| -Organelles are internal structures | - Have a flagella |
| -They have no mitochondria | -Examples: bacteria, archaea |
| -Larger (10-100 μm) | -Examples: animals, plants, fungi, algae |

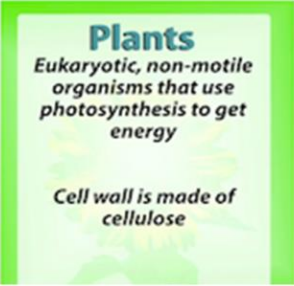
PROKARYOTIC	EUKARYOTIC

According to the classification obtained, describe the prokaryotic and eukaryotic cells.

Prokaryotic:

Eukaryotic:

7.6 Appendix F

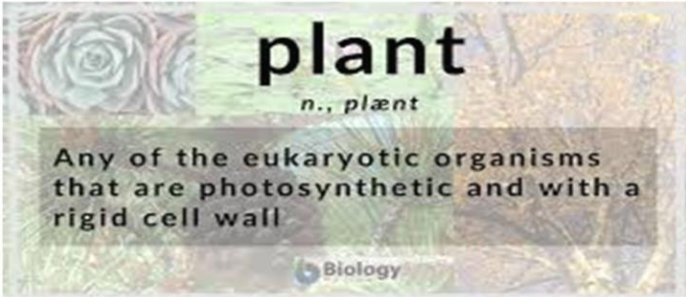
 Plants <i>Eukaryotic, non-motile organisms that use photosynthesis to get energy</i> <i>Cell wall is made of cellulose</i>	 Fungus <i>Eukaryotic, non-motile organisms that are heterotrophic</i> <i>Cell wall is made of chitin</i>
---	--

What is Fungi?

- Kingdom Fungi
- Eukaryotic
- Multicellular
- Cell walls made out of carbohydrate chitin
- Can't make their own food, absorb nutrients directly from soil.
- “Decomposers” feed on dead/decaying organisms
- Found in all environment



 Plants made up of many cells with a cell wall, and build up their own food by photosynthesis	 Fungi mostly made up of many cells with a cell wall, never photosynthesize and feed on ready-made food
--	---



plant
n., plænt

Any of the eukaryotic organisms that are photosynthetic and with a rigid cell wall

 Biology

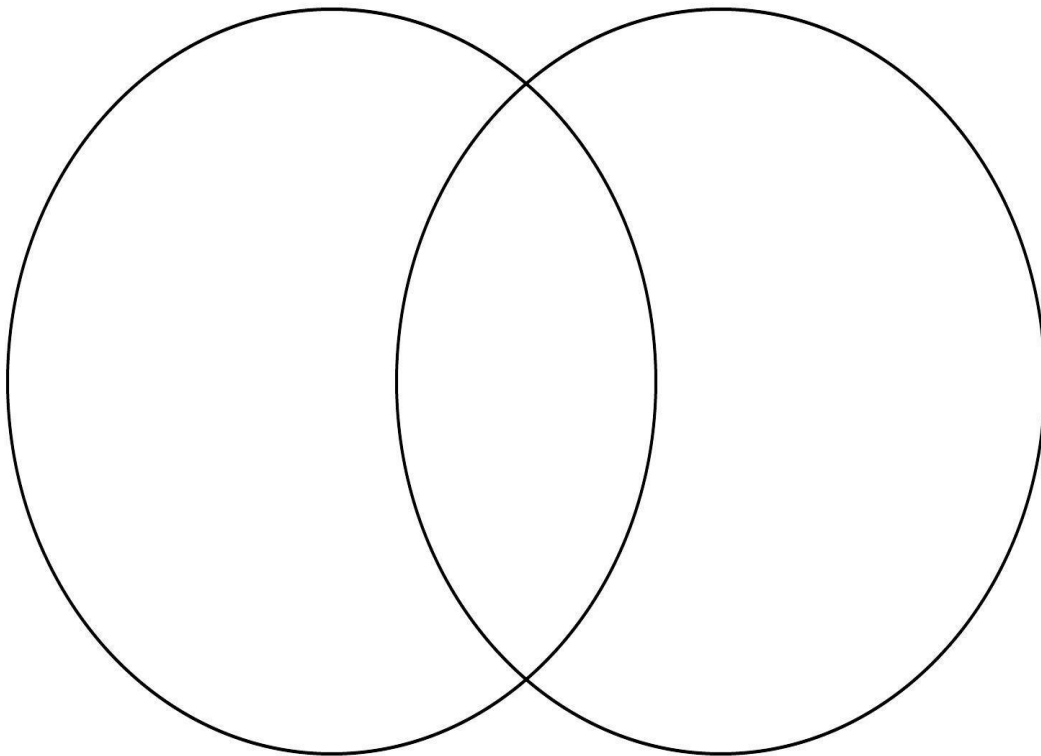
7.7 Appendix G

WORKSHEET

COMPARE AND CONTRAST

Using the following information about fungi and plants, make a Venn Diagram.

Similarities	Differences
-Both are multicellular	-Plants can make their own food, Fungi cannot
-Both are nonmoving	-Fungi digest food by extracellular digestion, plants have photosynthesis
-Both grow underground	-Fungi cell walls are made of chitin
-Both produce spores	-Plant cell walls are made of cellulose
-Both are Eukaryotics	



7.8 Appendix H

Video about reproduction in organisms (sexual, asexual, simple division)

<https://www.youtube.com/watch?v=5SuvKvGI4-4>

https://www.youtube.com/watch?v=mtYCd2LAr_w

Worksheet

1.-Use the table below to distinguish sexual and asexual reproduction

	Sexual	Asexual
Number of parents		
Genetic makeup of offspring		
Examples of organism for each method		

Answer the questions.

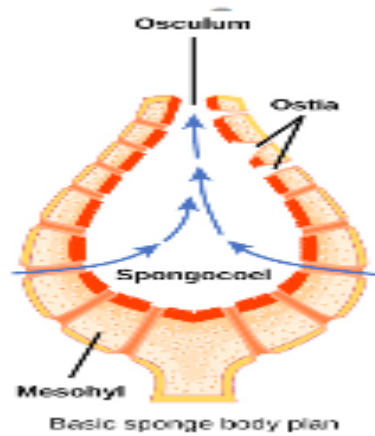
1. How does cell structure differ in eukaryotic and prokaryotic organisms

2. What is the difference between seeds and spores

Define: gametes

7.9 Appendix I

Poriferous



Explain in your words how poriferous help the environment.

Match with lines to complete the sentences

- 1.-Poriferous are known as...
- 2.-They feed through
- 3.-They are considered as of...
- 4.-Their body is mainly made up of.....
- 5.- Most are....

- less complexity
- collagen
- sponges
- marine
- small pores that absorb water

7.10 Appendix J



. Economic/Environmental Importance

1. Filter & clean water.
2. Control some animal populations by eating excess larvae.
3. Bath sponges sold for cleaning, exfoliating, personal hygiene, etc.
4. Part of food chain
5. Provide habitat for many types of animals.




Importance of Sponges

- Reefs provide habitat for many animals
- Vacuums of the sea -- clean up the sea floor/oceans
- Sponges are a commercial venture
- Several medicinal compounds, including antibiotics, antiviral drugs, and drugs for leukemia come from sponges.

7.11 Appendix K

“Phylum Coelenterate: diversity in living organisms”

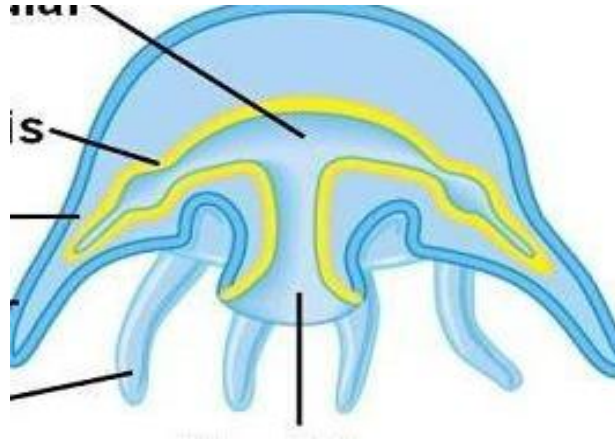
<https://www.youtube.com/watch?v=8D6jVVrrxJU>

“Kingdom Animalia: Phylum Coelenterates”

https://www.youtube.com/watch?v=1WBZGe2_OzM

WORKSHEET

Complete the diagram with the part of coelenterates



Tentacle, Gastrovascular cavity, gastrodermis, mesoglea, epidermis, mouth/annus

Summarize

Fill in the blanks with the words in the box below:

The name “coelenterata” comes from” kollos” which means _____ and “enteron” which means _____.

Phylum its characterize by the presence of _____.

They are mostly _____ aquatics, but few are _____ such as: _____

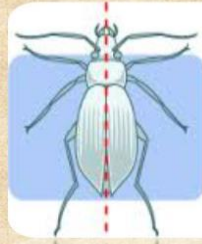
Body shows _____, it can be divided into: _____.

_____, _____, and _____ organs are entirely absent.

Digestion is partly _____ and partly _____.

Respiratory, intracellular, excretory, circulatory, extracellular, hallow, gut, marine, radial symmetry, fresh water, hydra, equal half, coelenteron

Bilateral Symmetry

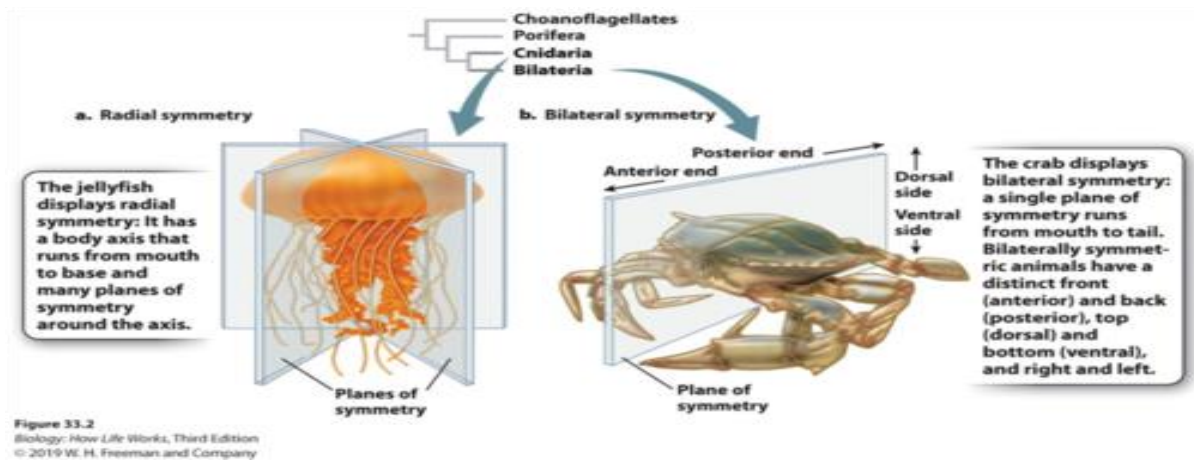


a beetle has
bilateral symmetry

- Can only be cut in one way to get equal halves
- Most animals fit into category
- Many parts are paired with one on each side of the body

Advantage: Leads to *cephalization* (sensory organs and the brain get moved to the head end of the animal)

Disadvantage: Hard to detect predators chasing them.



Animal	Symmetry		
	Asymmetry: It is a lack of symmetry that is there is no particular pattern to body shape."	Radial symmetry: It is the symmetry in which two identical halves are formed when any longitudinal cut is done through the central point of the body of an animal.	Bilateral symmetry: It is a symmetry in which a definite left and right halves are formed when a single longitudinal cut is done down the centerline of the body of an animal.
Sponge	+		
Hydra		+	
Bobcat			+
Jelly		+	
Snake			+
Turtle			+
Octopus			+

FLATWORMS

Kingdom Animalia

Phylum Platyhelminthes

Ex. Planaria, flukes and tapeworms



Introduction to Platyhelminthes

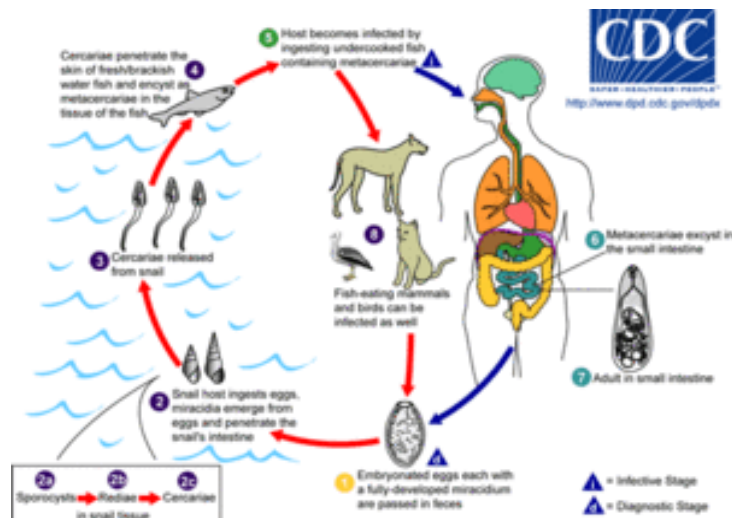
- **Bilateral Symmetry**
- Commonly called Flatworms because their bodies are thin between the **dorsal** (top side) and **ventral** (bottom side) surfaces
- Include free living and parasitic species
- Four classes: Turbellaria (mostly free-living flatworms), Monogenea (monogeneans), Trematoda (trematodes, or flukes), and Cestoda (tapeworms).



http://717.photobucket.com/albums/vw179/ncngMikey513/st2_2668208-gummy-worm.jpg

Sammy Keshavarz

Flatworms that affect human health



7.14 Appendix N

Characteristics of Pathogenic Bacteria

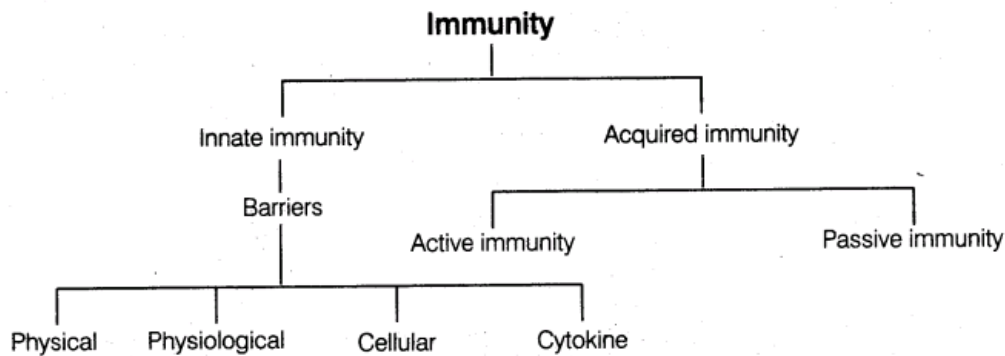
1. Transmissibility
2. Adherence to host cells
3. Invasion of host cells and tissue
4. Evasion of the host immune system
5. Toxigenicity

A bacterium may cause diseases by

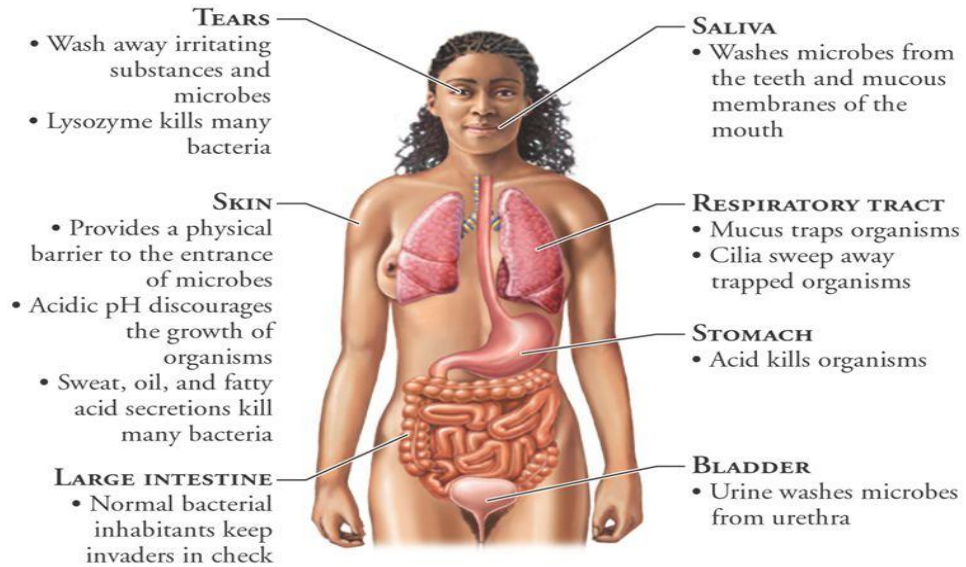
1. Destroying tissue (invasiveness)
2. Producing toxins (toxigenicity)
3. Stimulating overwhelming host immune responses

Species (Classification) No. of genomes analyzed	Genome size (mb)	Habitat niche	Disease	References
<i>Neisseria meningitidis</i> (Betaproteobacteria) 5	2.2	Upper airway colonizer	Meningitis, septicemia, Waterhouse-Friderichsen syndrome	Parkhill <i>et al.</i> (2000a), Tettelin <i>et al.</i> (2000)
<i>Neisseria gonorrhoeae</i> (Betaproteobacteria) 1	2.1	Urethra	Gonorrhea	Oklahoma University Website
<i>Haemophilus influenzae</i> (Gammaproteobacteria) 6	1.9	Upper airway colonizer	Pneumonia, meningitis, bacteremia, otitis media and more	Fleischmann <i>et al.</i> (1995)
<i>Streptococcus pneumoniae</i> (Bacilli) 3	2.0	Upper airway colonizer	Pneumonia, septicemia, otitis media, peritonitis, pericarditis, meningitis, brain abscess and more	Tettelin <i>et al.</i> (2001)
<i>Helicobacter pylori</i> (Epsilonproteobacteria) 3	1.6	Stomach and duodenum	Peptic ulcer and gastric cancer	Alm <i>et al.</i> (1999)
<i>Campylobacter jejuni</i> (Epsilonproteobacteria) 6	1.6	Gastrointestinal	Main cause of diarrhea in Europe, inducer of the Guillain Barre syndrome	Parkhill <i>et al.</i> (2000b)
<i>Staphylococcus aureus</i> /MRSA (Bacilli) 14	2.8+	Nose and skin	Pneumonia, meningitis, toxic shock syndrome, septicemia and skin infections	Herron-Olson <i>et al.</i> (2007)
<i>Streptococcus pyogenes</i> (Bacilli) 14	1.9	Throat and skin	Diverse pathogenic outcomes/ diseases – flesh-eating bacteria	Ferretti <i>et al.</i> (2001)
<i>M. tuberculosis</i> (Actinobacteria) 5	4.2+	Lungs, extrapulmonary locations	Tuberculosis	Cole <i>et al.</i> (1998)
<i>Bacillus subtilis</i> (Bacilli) 1	4.2	Soil	Reference bacterium	Kunst <i>et al.</i> (1997)
<i>Escherichia coli</i> (Gammaproteobacteria) 18	4.6+	Intestine, sewer	Reference bacterium	Blattner <i>et al.</i> (1997)

Class of immune barriers



Innate Immunity: Surface Barriers



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