

## **Gamification in CLIL lessons.**

### **Creation and implementation of a vocabulary game specialized in natural sciences for EFL learners**

*Final Degree Project*

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## **Abstract**

This study explores and discovers the game methodology as a way of learning in CLIL, specifically in the areas of English language and natural sciences, to investigate whether it is a good method to develop communicative skills and expand vocabulary knowledge in different areas. The students' opinions are collected in graphs to see the percentages, and the results are focused on three observation rubrics to answer the hypotheses raised.

**Keywords:** English foreign language, games, CLIL, natural science, young learners.

## **Resum**

Aquest present estudi pretén explorar i descobrir la metodologia del joc com a forma d'aprenentatge en CLIL, concretament en les àrees de llengua anglesa i ciències naturals, per poder investigar si es un bon mètode per desenvolupar habilitats comunicatives i ampliar el coneixement de vocabulari de les diferents àrees tractades. Les opinions dels alumnes es recullen en gràfiques per poder veure els percentatges de resposta i els resultats se centren en tres rubriques d'observació per donar resposta a la hipòtesis plantejades.

**Paraules clau:** Anglès com a llengua estrangera, jocs, CLIL, ciències naturals, infants.

## 1. INTRODUCTION

For many years, society has considered games as part of entertainment for children, youth, and adults. However, many studies ensure the remarkable effectiveness of games for children as it helps them create both social and personal skills that will be useful for their complete education.

Many factors can be involved in a board game that will have a significant impact on children. The development of communication skills, social relationships, logical and strategic thinking, the values of companionship when it comes to winning or losing, cooperative work between teams and respect, will be fundamental to acquire not only the knowledge involved in the game but also the skills necessary in a more tolerant society.

A quote that inspired me to carry out this project was the following:

*“The games are a form of teaching which may be used in circumstances where ordinary approaches are not well tolerated; when attention is hard to get and harder to keep”*

*(Nicolson and Williams, (1975, p. 1).*

This made me reflect on how I want to innovate in my educational practice to be able to give children the most appropriate method to learn all those optimal skills to be able to develop in an environment, knowing all the necessary vocabulary and the correct communicative strategies.

That is why the present study conducted by the student Laura Montells, currently in her last year as a primary education teacher with a major in the English language, focuses on investigating what are the accurate results after the application of a game that has been created from scratch, intending to teach natural science content through the English language.

The application of the game will be in a natural environment of a school called Casals Gràcia, where the effectiveness of the technical aspects of the game will be analyzed, the result of the application in middle school classrooms, and also the skills that children develop during the game, to respond to the objectives previously set.

Therefore, the main objective is to discover the most significant characteristics of games to create a game in the CLIL environment and make a practical application in a school to check if children can learn through the play.

The main parts of this document begin with the research of theoretical bases of authors that prove the effectiveness or not of the games in different classrooms, followed by the practical application where you can observe the whole process of design and creation of the game, you can know more closely the groups of children that are made the practice and then the results of the application of the board game will be known.

## **2. THEORETICAL FRAMEWORK**

### **2.1. Teaching English as a foreign language to young learners**

Numerous educational centers watch over a full integration of contents in English to ensure the creation of meaningful knowledge that helps young learners to develop, in terms of cognition, the necessary skills which will allow them to solve future communicative situations in English.

Young learners refer to children from six years old, schooled in the first year of elementary stage, to those learners from the last year who are twelve years old approximately. However, Bakhsh (2016:121) considers that "the age of children is not necessarily an indicator of how mature they are." Children tend to focus the attention on the purpose of the language rather than stipulated rules, as believed Sudartini (2012).

Teaching young learners is a more complicated process than teenagers or adults due to children's difficulty understanding and integrating complex and abstract structures. Nevertheless, according to Bakhsh (2016), young learners do not have responsibilities or worries that allow them to focus easily on learning contents. To ensure satisfactory attention from the learners, Brown (2001) recommended to offer authentic materials in classroom activities and an accurate language speech to help retain meaningful communicative patterns and specific content. Teachers' linguistic level must provide meaningful information for children who are very sensitive to acquire familiar speech models in these stages. Therefore, applying sensory aids or nonverbal language movements are significant steps to help young learners build and understand communicative situations in which they will express themselves.

Furthermore, it must be taking into account the time children spend paying attention inside the classroom. They spend much time watching their favourite animated films; however, they easily lose their attention when they hear the English teacher's explanation for a short time. This situation is due to the lack of interest they show when

they find the speech boring or too difficult to understand. Teachers need to know the learners and their language level to adapt the explanations and capture the maximum attention of all learners. Another way to focus children's interest and obtain meaningful results is to provide the necessary tools to make learning as experiential and fun as possible, as mentioned by Sudartini (2012).

According to Cameron (2001), teachers need to be aware of four things related to skills and knowledge when teaching English. They must be able to identify the difficulties that pupils have during the teaching of language. Besides, they have to be aware of the learners' interests and the way they have to learn and think. Moreover, it is important to consider the resources needed to teach whole lessons orally to ensure a complete acquisition.

Harmer (2008) considers that "teachers of young learners should spend plenty of time examining and understanding how their students operate and think."

Language learning offers a communicative atmosphere that helps children to express themselves freely by sharing personal experiences. Halliwell (1991) stated that language in many contexts is unpredictable, and therefore many young learners have difficulty communicating, so they need to be encouraged to be active and participate in their learning in the classroom.

## **2.2. Impact of games in EFL classroom**

When we talk about games, the words "fun" and "entertainment" may come to mind as they have probably been part of many moments in any student's life. Games can be a useful tool for learning foreign languages such as English.

Yolageldili (2011) considered that game is a special role to play in learning a language for young learners as it makes it much easier to acquire the target language by providing meaningful contexts to motivate them. Rixon (1991;3) describe games as a "form of playing governed by rules." Children focus on learning when they are interested in what is presented and know that it can be fun. As Richard-Amato (1988) stated, games help reduce anxiety for all those shy students, allowing them to express themselves and make them acquire the contents more pleasantly. Besides, scientific contributions such as "The useful of games are attract the student to learn English because it is fun and make them want to have experiment, discover and interact with their environment" (Lewis and Bedson, 1999;7).



Teachers can use the games to reinforce the four skills as they are part of a communicative context within the classroom, and therefore, language plays a crucial role. "Games involve many factors such as employing rules, fostering cooperation while making learning fun" (Yolageldili and Arikan, 2011, p. 220). Similarly, games' making learning easier in an enjoyable way suggests that games are full of fun, leading to successful learning" (Yolageldili, 2011:220).

The time when games should be used in the classroom is conditioned by the belief that games serve to entertain children when there is time left to keep them distracted. As Lee (1979;3) stated, "games should not be regarded as a marginal activity, filling in odd moments when the teacher and class have nothing better to do." It is essential to make clear the concept of play as a tool for didactic learning that helps to acquire and consolidate knowledge and, on the contrary, avoid creating the idea of keeping children busy when they do not have anything to do.

### **2.3. Typology of games**

The authors Wright, Betteridge, and Buckby (1994) show the different types of games that can be played in the classroom in general terms and can be used for language learning. They mention the following types:

1. Picture games
2. Psychology Games
3. Caring and Sharing games
4. Sound games
5. Story games
6. Word games
7. True and false games
8. Memory games
9. Question and answer games
10. Guessing and speculating games

When choosing a type of game, teachers have to consider what the students are like and select one that is most appropriate in the context in which it takes place to facilitate and ensure personalized learning is adapted to all the students' needs. As scientifically exposed by Bakhsh (2016), offering students the possibility of physical movements helps stimulate interest and stay alert during the lesson. It also guarantees the students' maximum participation as it creates an atmosphere based on motivation. It is also

necessary that students know more than just how to play, and the teacher has to complement this by demonstrating the parts of the game and introducing the target language so that the children can properly follow the game's instructions.

Sugar and Sugar (2002) considered that when selecting a suitable game, they have to consider several elements to make the right choice. It is crucial to keep in mind the target audience that participates in the game. Moreover, the Language level required is essential, as well as the number of players and the space available for the play. Last but not least, the learning outcomes, the playtime, and its variation are part of the necessary tool to determine which games fit best in the context.

As the following author states “Teachers must decide whether the level of the game fits students’ language level because a game may become difficult when it is beyond the learners’ level or it may become boring when learners find it too easy to carry on” (Yolageldili, 2011:222).

## **2.4. Advantages of using games in EFL teaching**

The introduction of games for learning the English Language provides numerous advantages and benefits that ensure a full knowledge acquisition. Some authors such as Wright, Betteridge, and Buckby (1994) talked about the advantages of implementing games in a classroom context to learn a foreign Language. The most relevant ones are highlighted below: Games help the teacher to create contexts in which the language is useful and meaningful.

- Games provide intense and meaningful practice of the language.
- Games provide practices in all the skills (R, W, L and S), in all the stages of the teaching/learning sequence (presentation, repetition, recombination, etc), and for many types of communication (encouraging, agreeing, explaining).

Furthermore, not only have these authors spoken about the advantages. The authors Sugar and Sugar (2002) identified the following benefits that are among the most important once:

- Games provide immediate feedback
- Games improve teamwork
- Games foster both individual and team achievement
- Games reinforce and improve multitasking

Yolageldili (2011:220) considered that "Learners are motivated to learn the language when they are in a game." When children play, they lose sight of the fact that they are learning, as play is a method they use in their free time and for entertainment where there is no stress or anxiety in between.

In Crookall (1990) opinion "learners and teachers change their roles and relations through games and learners are encouraged to take active role in their learning process. As a result, games provide learners with a chance to direct their own learning".

McCallum (1980) exposed other many advantages related to using games for teaching English such as:

- focus students' attention on specific structures, grammatical patterns, and vocabulary items.
- involve equal participation from both slow and fast learners.
- provide immediate feedback for the teacher.
- can be adjusted to suit the individual age and language levels of the students.
- ensure maximum student participation for a minimum of teacher preparation.

To sum up, "games have a great pedagogical value providing language teachers with many advantages when they are used in foreign language classes" (Yolageldili, 2011:221).

## **2.5. Vocabulary games**

Bakhsh (2016) considered that vocabulary is a fundamental pillar in the learning of any language. Teaching these primary contents through games is essential to guarantee a high level of interest, strengthen the use of the language in the classroom creatively, and eliminate fears and insecurities.

In order to speak and write English, children need to learn one to two thousand words (Cameron, 2001). However, as Nevadi (2017) explained, vocabulary in primary education is taught as isolated words that cause children not to contextualize and not give the correct meaning to the content they are being taught. Moreover, Wright, Betteridge and Buck (as cited in Rohani & Pourgharib, 2013, p. 3541) consider that "With the use of games, the teacher can create various contexts in which students have to use the language to communicate, exchange information and express their own opinions".

Riahipour and Saba (2012) mentioned that traditional activities such as memorization of long vocabulary lists, derivations, repetition of words, translation, fill-in-the-blank exercises are boring for students.

As Piaget's theory states, a child of 7 to 10 years of age shows interest in knowing different words and repeating them to memorize them.

*“In order to communicate well in a foreign language, students should acquire an adequate number of words and should know how to use them accurately. Students only think of vocabulary learning as knowing the primary meaning of new words. Students usually only acquire new vocabulary through new words in their textbooks or when given by teachers during classroom lessons.”* (Huyen, 2003: 2)

As Sorayaie (2012) explained, when learning a foreign language, vocabulary is an element that connects the language's four skills (speaking, listening, reading and writing). It creates a communicative situation that obliges children to use them, thus creating a very complete and contextualized learning process.

Hatch and Brown, 1995 proposed the following essential steps for learning vocabulary:

- Having source for encountering new words.
- Getting a clear image for the form of new words.
- Learning the meaning of new words
- Making a strong memory connection between the form and the meaning of the words
- Using the words.

To achieve these steps, an optimal communicative situation must be followed to allow the child to develop the steps to acquire the actual content fully. That is why play has so many benefits for language acquisition.

## **2.6. Cooperative learning in EFL classroom**

*“Stating that CL is teaching (learning) method intended for small groups of learners with various competences and needs who learn together to seek the common goal. Students learn in the group but at the same time they comprehend their personal responsibility as the crucial deposit to achieved personal and group result.”*

*(Stepanoviene, 2013: 246)*

As Yolageldili (2016) explained, young pupils like to cooperate and interact socially with the other team members, as in many cases, it is essential to work with their teammates to achieve the game's objective. Combining cooperation with fun can, in many cases, lead to successful and meaningful learning during the game. However, Rixon (1991) explained that there is also a competitive side in many games in addition to cooperation. In many cases, young learners have to work together to achieve the objective set by the game and beat the opposing team. However, in many contexts, competition should not be superimposed on cooperation in foreign language learning.

As Stepanoviene (2013) points out, the cooperative learning method favours improving learners' skills and thus solves possible problems they may have in the acquisition process. In a cooperative context, particular aspects are emphasized, such as the acquisition of personal responsibility that each student must assume, favouring an environment where communication is a fundamental pillar, and facilitating all team members in the learning process. The accomplishment of all aspects will make much more interaction that allows easy acquisition of content.

“Recently it is widely discussed in the communities of linguistic educators of many countries about cooperative learning (CL) method which, according to scientists of this field, is particularly effective when learning foreign language.” (Stepanoviene, 2013: 246).

## **2.7. Vocabulary games assessment in EFL context**

At first, it may seem difficult to assess students through playing a game as a method of acquiring knowledge. The author's Nguyen and Khuat (2003) determine that children's experiences help in the learning process. In their study, they focus on the perception and attitude they show, as well as the knowledge acquired during the vocabulary game.

To assess student learning, Kenneth (2003) proposed two methods used throughout the history of education: a before – and – after questionnaire (this allows measuring whether the student's knowledge shows a noticeable evolution during the learning period between the initial and the final assessment) and playing the game twice (this method allows us to see if the children make any modifications to the previous procedure due to the knowledge they have acquired).

However, Kenneth (2003) exposes the difficulty of developing effective assessment instruments for the acquisition of a foreign language. The author, therefore, outlines three reasons why it can be complex to develop specific assessments:

*“For one thing, it was desirable to separate learning as a result of the game from the learning gained as a result of other pedagogical techniques used to teach this topic. Since the game is relatively short and is followed by lecture and case studies on the same topic, it would not work to simply test them at the end of the material. Secondly, some prior studies have used a game for one group of students and not for others, and then compared performance. Third, it was desirable to determine students’ understanding before playing the game in order to compare it to knowledge after the game.”*

*(Kenneth, 2003:5)*

## **2.8. Content and Language Integrated Learning**

As mentioned in Cambridge (2010) magazine, the acronym CLIL is referring to Content and Language Integrated Learning, it is a method by which learning is focused on specific curricular content taught in a language that is not the students' native language. A key example is learning natural sciences through English, which leads to develop subject-specific knowledge and understanding of concepts. Teachers in charge of programming CLIL sessions need to know what academic language the children need to acquire, in order to achieve an effective communicative situation where they share knowledge learned, processes to follow, and evidence to show. Besides, teachers have to ask specific questions related to ideas developed in the classroom, evaluate experimental evidence and formulate conclusions through the learning processes carried out in the session.

As Coyle (1999) explained, to carry out adequate planning of the CLIL lesson in any curricular subject, the 4 C's have to be considered:

- Content: Consider what content you want to present in the lesson.
- Communication: Analyze what language children use to communicate knowledge during the lesson.
- Cognition: Recognize the cognitive skills that children have to perform during the lesson.
- Culture: Evidence a cultural focus during the lesson that leads the children to cultural thinking.

As Snow, Met & Genesee (1992) pointed out, it is essential to bear in mind that in a CLIL communicative situation, there are two different types of language that children are likely to use in the course of the lesson. Firstly, there is the Content-obligatory language which is the one that is connected to the specific content that is being acquired. In this first type, children will try to use scientific vocabulary, concrete grammatical structures, and ideas related to the curricular content presented in the subject. Furthermore, there is another type of language called Content-compatible language, in which children acquire the vocabulary mainly in the target language classes. Students can use it in the context they find most appropriate, whether it is of an academic or informal nature. It is crucial to keep in mind that as a teacher, exposing the two forms and typologies of language will make children aware of what are the practical bases for creating a good and most communicative conversation with their partners.

### **2.8.1. Considerations when planning a CLIL session**

As mentioned in the magazine of Cambridge (2010), there are six fundamental pillars to consider when planning a CLIL session in science:

- Firstly, it has to be taken into account what prior knowledge the group of children has about the session's topic and content. Many related ideas may come up and show that the students know about the topic. However, often these are presented in L1 as they find it difficult to express the knowledge in the target language, which can be the L2 or even the L3 of the children. To help name all the children's ideas, it is recommended to brainstorm to get the most out of the children's contributions.
- The planning of inputs and outputs help in planning from a more general overview of the aspects that may come up. It is essential to keep in mind how the inputs should be presented (orally, in writing, through a resource or virtually) in order to provide as much concrete information as possible to be clearly understood by the learners. Besides, the teacher should clarify to whom the information is addressed, whether in groups, pairs, or individuals. Moreover, the outputs that children can express must be taken into account. Therefore, the teacher must focus on the communicative productions that are developed in the classroom and the language they use to do so.
- When teaching a non-native language, thinking and speaking become longer as it requires more effort to think and communicate ideas. Teachers should keep in mind that when asking questions, they should allow plenty of time for the learner

to process the information and create communicative strategies to share the answer to the question. This allows children to feel more confident and not to be pressured to respond quickly, as this can lead to stress and inadequate responses, causing children not to show their proper level of speech.

- The introduction of cooperative and collaborative tasks will facilitate communication between students within the classroom, allowing them to acquire more meaningfully the specific content by helping each other and learning from common mistakes. It is also an excellent help to all learners who have difficulties communicating either because of shyness or other linguistic impairments, thus providing a sense of comfort and closeness.
- Learners need support to develop their communication skills concerning a non-native language. They must be able to communicate not only in the usual, functional everyday language but also in any language connected to specific content. Providing effective scaffolding in les classes de CLIL, will provide temporary help for many children in need. However, it is a difficult challenge for all teachers as learners need a large number of strategies and aids that will change rapidly as learning is acquired and becomes knowledge. At this point, the aids will have to be modified as necessary.
- Finally, developing thinking skills enables children to focus on the teacher's communication to be appropriate. The lower order thinking skills (LOTS) encompasses all those questions such as "what, when, where, and which," which form part of the group of questions that are less difficult to answer in a few simple words. Otherwise, higher order thinking skills (HOTS) containing questions related to "why and how" that provide a much more complex answer than the previous one. They no longer need simple words, but this time it is necessary to structure a good sentence in order to express a scientific explanation process. However, the latter questions are commonly used in a scientific environment related to knowledge of complex scientific processes to be expressed.

### **2.8.2. Kind of teachers in CLIL lessons**

As shown in the magazine of Cambridge (2010), when a CLIL class is set up, two types of teachers may appear differentiated according to their knowledge of a particular subject area. These are the following:

- First of all, we can find what we know as subject teachers, those who specialize in the curricular subject being taught. They have much specialized knowledge



and can understand and argue concerning the session's subject matter. One of the difficulties they may have is the lack of knowledge of the language in which the stipulated content is presented. They are uncomfortable with the level of English, mainly if they have not used it for a long time. The use of digital dictionaries is recommended to help name the specific vocabulary and perfect the proper pronunciation of the main concepts to be able to use language appropriate to the planned content.

- Another type of teacher are those who are appointed as language teachers, who specialize in the language presented in the lesson. They show great command of the spoken language, have a wide range of concepts, and express sentences with the correct structure. However, they have difficulties and are insecure in conveying concepts appropriate to the learning they are supposed to convey to them. They need to acquire specific curricular knowledge of the area and scientific skills to give the right content to the students. To be able to conduct a correct scientific session, they must be able to explain the concepts effectively so that the students' learning process is optimal. They must also be able to answer any questions the students may have and be able to provide the required knowledge. It is recommended to use online resources, both specific textbooks, and activities, to improve educational practice. It is essential to have a wide availability of creative materials that help to understand the processes being worked on in the classroom, to prepare answers to possible questions that may arise during the activities and that require clear and adequate answers, and finally to improve thinking skills in order to be able to conduct a session with confidence and security.

Both types of teachers have to consider that it is essential that they maintain fluid communication to work cohesively around a curricular content and benefit from the lack of knowledge in one area that the other person can bring to the table. Sharing knowledge will help to build confidence in one's teaching practice.

### **2.8.3. Planning CLIL in lessons**

As shown in the magazine of Cambridge (2010), there are many more components to consider when planning a CLIL session than a specific language session or curricular subject. Below we can find nine areas that need to be planned in a CLIL session to provide appropriate content in a real-life context:

- Learning outcomes and objectives: The teacher has to consider the primary objectives he/she wants the learners to achieve after all the learning processes are carried out during the didactic unit. What process do you want students to follow? What do you want them to learn? What will they be able to do at the end of their learning? These and many others will be some of the critical questions to ask at the beginning of the session to have a guideline for how you want to guide your learning. One of the things to bear in mind is that often the objectives do not end up feeling approximate or accurate and can be challenging to achieve. Therefore, it is crucial to take into account the capacities of the learners and to set achievable objectives.
- Subject content: It is essential to be clear about the learners' prior knowledge of the subject matter covered in the sessions and the specific new concepts they will learn in the acquisition process. This will be significant to have a guide to modify and establish activities to review the knowledge learned and propose activities to develop and discover new concepts specific to the area of natural sciences. To visualize the children's prior knowledge, it is crucial to start the session by brainstorming and talking about the topic to be covered in the activities to visualize the feedback and contextualize the knowledge.
- Communication: Collaborative and cooperative activities help maintain fluid communication between learners and enable them to acquire specific strategies and skills more effectively. It is recommended to plan activities where groups of two or teamwork are involved in promoting shared learning.
- Thinking and learning skills: The development of thinking and learning skills is essential within the CLIL classroom and is, therefore, one of the areas in which teachers need to plan more carefully. It is essential to consider what it is like to move from lower to higher order thinking skills within the session. To observe this process, different types of questions should be planned to be clear about the degree or level of learning of the learners concerning the content in question.
- Tasks: To achieve meaningful student learning, it is necessary to take into account the type of tasks required in the session. Within the types of activities, we can find the less demand tasks (include those that are either coastal response or observation of results) and the more demanding tasks (include those that require a more significant effort of response either because they must argue based on evidence or analyze a scientific process).
- Language support: The language and the teacher's support in the classroom are fundamental to good teaching practice as it is crucial to take into account the inputs and the outputs of the vehicular language in the classroom. These

resources can be provided by observing the words, phrases, and textual levels presented by the learners.

- Materials and resources: To present specific content, teachers need to make use of materials to creatively expose all the knowledge that needs to be acquired during the session. The materials have to be well prepared in order to be as accurate as possible. In the case of using online resources, it is important to consult them beforehand to see if the language the children will be exposed to is understandable at their linguistic level.
- Cross-curricular links: CLIL promotes the knowledge of other subjects, which can be closely related to the contents presented by the teacher. This allows content from other areas of knowledge that can help the learning process be involved in a single activity. A clear example could be the introduction of mathematics if some calculation is required within an experiment or analysis of geometric figures. On the other hand, historical or literary concepts can also appear related to the knowledge being worked on in the subject.
- Assessment: It is crucial to link classroom learning with observation and evaluation. A formative evaluation allows taking into account the learning and the process of what the children show during the educational activity. Observation and analysis of feedback will reflect the linguistic and specific level of the children. It is essential that after each activity, the teacher keeps a record of all significant annotations and places them on an evaluation chart to keep track of improvements in the children's learning.

### **3. STUDY**

In the present study, all the necessary actions are grouped together to fulfill the objectives specified in the realization of the project.

In the first place, the whole process of making a board game from scratch, from its design to its creation and specification of the materials used, will be reflected. Here you will be able to see all the steps that have been carried out to complete a competence game that helps the growth of knowledge of the pupils.

Then you will be able to see the school where the practical part will be applied and where you will be able to analyze the behavior and evolution of the children through the game. In this same section, you will be able to get to know the school closely, as well as the educational environment. We can also get to know closely the group of children to whom

the game will be applied in order to put into context and understand the results reflected in practice. Once the age groups are well developed, the intervention will be carried out in the school to recapture the results. To understand the functioning in the classroom, a detailed description of the game session will be made, explaining the difficulties and achievements that have been achieved in the development of the activity.

Once everything is clear, the results will be collected through the previously created rubrics to be able to determine the effectiveness or not of the designed game, and at the same time, the behavior and the competence progress shown by the students during the learning process.

### **3.1. Objective and hypothesis**

The main objective of this study is to find out what impact games can have on learning two curricular subjects simultaneously, such as English and the natural sciences of the human body. This investigation aims to discover whether CLIL games can be a source of positive information to develop significant knowledge in specific areas and be able to create a board game suitable for these inputs.

By searching for contrasted information related to the benefits and positive results of the implementation of games in the classroom, we propose creating a board game where curricular areas of primary education are combined. This, with the purpose of creating quality didactic material and to be able to see all that is involved in the design and creation of an educational game that allows children to develop adequate learning skills and make a good acquisition of knowledge.

My hypothesis implies that teachers may find negative aspects about implementing games in the classroom due to the extracurricular hours they have to dedicate and difficulties in preparing games that require so much complexity and bring together a lot of time-consuming.

### **3.2. Design and creation of the game**

#### **3.2.1. Purpose of the game**

The main purpose of the design and creation of the game is to be able to contrast the results of different authors with one's own real experience.

In this way, it will be possible to observe whether the children are able to learn social skills and teamwork, combining the learning of two complex areas such as the English language and the natural sciences of the human body. To provide tools to guarantee an autonomous acquisition of knowledge through strategic rationing, which involves playing and introducing a free dynamic for learning by playing.

### **3.2.2. Game design**

One of the essential parts of creating a board game from scratch is to have a clear idea of how it is going to be designed so that everything fits together perfectly. The design helps me to plan the general and specific structure of the game in order to minimize any possible errors when creating it.

In the practical case of this project, the first idea that I had in mind was to create a new and unique game in the market to guarantee an educational innovation when implementing it in the classroom and make sure that it would not be comparable to any other current board game. That is why it was designed based on creating an educational game that would combine the work on the natural sciences of the human body with the acquisition of English language communication skills. So, it was designed with two essential parts in mind.

First of all, a design program called Canva was used to create what would become the game board. This was based on a silhouette of a woman that took up the entire sheet of paper so that the corresponding organs could be placed one by one in an orderly fashion and with sufficient space. Once the base was created, the organs were introduced as realistically as possible to guarantee optimal and meaningful knowledge. Each of the images used for creating the board was extracted from the program itself with legal and permitted copyrights. Once the background design was ready, the layout of the squares was organized. These were designed so that the movement around the board is circular and free, making it easier to reach all the organs positioned vertically. Once the outer circuit was planned, the squares that would pass inside the organs were designed, and, in order to be equitable, between 8 and 10 squares per organ were created. To be recognizable, I was put in a softer color, and a cross was drawn on top of them to highlight immediately the parts that needed to be cured. Once the squares had been designed, four points were marked, through which the clover square would be placed, which would serve as an aid during the game. This board was created so that it could be printed in any size (*Appendix 6.1*)

Once the board was designed, the planning of the cards began. Seven different types of cards were to be introduced into the game. Six of them corresponded to the organs (brain, heart, lungs, liver, stomach, and intestines) and were created with the same pattern. These cards contain questions, true/false statements, and dynamic activities related to each organ. In total, 216 cards were designed, of which 36 correspond to each organ. To form the questions, a reliable source of information was sought, which in this case was the book "My amazing body machine: Colorful visual guide to how your body works" written by Robert Winston. A lot of information was extracted from this book, which allowed me to formulate each question in the most appropriate way possible. Once all the questions and activities were written down, it was time to design it in a fun and easy-to-visualized style. With the help of the design program Canva, a straightforward and attractive kind of card was achieved for the children, adding an image of the corresponding organ on the back of each card to be easily identified. Once the questions, colors, and style of the cards had been selected, it was proposed to design the other group of cards that were missing. In this case, they were the ones that were to function in the clover boxes. These cards had neither questions nor activities, as they were created to provide help during the game. That is why these cards were to add or remove pills from the opposing team and even cure an entire organ. A style of cards was also incorporated to move forward in order to get to the desired organs faster. All types of cards were designed to be printed in approximately  $\frac{1}{4}$  A4 sheet size (*Appendix 6.2*).

### **3.2.3. Creation of the game**

Once the board and all the cards for the game had been designed, the creation and assembly began. In order to create a sustainable and environmentally friendly game, we wanted to prepare all the materials with non-polluting organic materials, such as wood and cardboard. In this way, a more innovative image is given to the children to learn that they can play and have fun without harming the environment. However, there was a difficulty along the way, and that was that printing cards with strong cardboard was costly and required more work, so they opted to use plastic to harden the cards and make them last longer. So, what was once a purpose became not possible during the creation.

For the creation of the board, an A1 sheet was printed in order to make all the squares visible. To make it look more like a thick board, a black foam board was put underneath to make it more rigid. Once everything was done, the board itself was cut into four parts to make it more practical when assembling and disassembling the game and so that it could fit in a storage box.

Then the colored chips and the container to keep them in were created. These were tiny pieces drawn with a paintbrush and paint to differentiate the color of each group.



Image 1: Box with colored pills

In total, 30 pills per color were created. Once created, a wooden storage box with six spaces was taken and painted in the shape of a medicine cabinet. Once painted, the pills were added to make it easier to sort them. In this same box was placed a wooden drawer with more of the game's items stored inside. Inside, a small bag was established with the tokens of each group. These were made in a way and were painted in the corresponding color. For each team, three pieces of the same color were created to ensure that there were spares if any of them were lost. In the same bag was the dice, which was also made of wooden material.

Finally, the cards were created, which involved many steps. First of all, they were printed in DN4 format. To make the cards thicker and more resistant, they were not printed double-sided, but on one side only, so that they could be cut out and glued to match the question with the card of the appropriate organ. Once all the cards were cut out and glued to double side, the corners were cut off to round them and give them a more polished and delicate appearance. Once ready, they were put through the laminator to ensure a durable and resistant finish for the children's hands.

Once all the cards were laminated, they were cut out, and the corners were also trimmed to make them rounded and avoid punctures due to the thickness of the plastic. In total, 216 cards of 10 cm wide and 14 cm high were created. Once all the cards were ready, a wooden stand was found so that they could be placed in an orderly fashion and so that the children would know which card to take out at all times.



Image 2: Game cards with questions

To finalize the creation process, the board was also plasticized to give it a durable and firm appearance, and a box was sought for storing and transporting the game. A box with red and white stripes was found to refer to the colors of the health cross, which had an exact size so that everything could be put inside.

It took about three weeks of work and the help of a printing company for large images, in the case of the board, to make all the objects that allow the game to be played.

### **3.3. School centre**

As specified in this study, the didactic intervention will be carried out in Casals Gràcia school in Manlleu.

Casals Gràcia is a small state-funded school with only one class per year, where children from nursery, primary and secondary education are grouped. The school is located in Manlleu, in a very quiet and familiar neighbourhood, the district of Gràcia. There are currently around 336 pupils and an average of 30 teachers working at different educational levels.

Teachers are organized by cycles as they are usually the ones with whom they interact on a day-to-day basis in the classroom, and therefore they tend to fit the activities together. That is why they meet weekly and agree on activities to organize the week and specific festivities such as Christmas, carnival, or the "castanyada," among others. Within the group of teachers, there are tutors, specialists, and people dedicated to special education (in this case, two speech therapists from CREDA, a psychologist, and teachers who provide extra support to those children who require special needs). Despite this, teachers realize the great importance that needs to be given to children with learning difficulties but finds few specialists and more hours to give them the support they require.

In general, they are teachers with a high capacity to socialize and communicate ideas among the team of teachers in the school, with a great desire to improve day by day and with a great capacity for observation and reflection that allows them to be more curious when it comes to detecting any problem that may appear in the educational environment.

The school is surrounded by houses and a large sandy square right in front of the school. There is also a park with trees and a bench where the children can enjoy playtime after school. The main entrance is small, and there is an office and a secretary's office. On the ground floor, there are classrooms for infant education (P3, P4, and P5) and one for the first cycle of primary education (1r).

There is a direct access to the courtyard on the ground floor, which is square and not very large. It has a large asphalt track between two significant goals, and around it, you can see spaces with artificial grass, baskets corner, a small mountain where the children go up and down, a swing, a small house, and a sandpit for the youngest children of the



school. Finally, there is a door leading to the gymnasium where motor and body control activities are carried out.

From the courtyard, you can see some stairs used to access the first floor where the primary classes (2n, 3r, 4t, 5e, and 6e) are located. There is also a computer room, an accessible space for psycho-pedagogues, psychologists, and special education teachers. They also have access to an art and music room currently not being used due to the protocols established to prevent contagion. All classrooms are connected by a corridor leading to the inner courtyard of the school.

Each class manages the layout of the space and the classroom material, as it will depend on the class teacher's tastes and the layout of the space. Once on the first floor and going towards the end of the corridor, you will find the space destined for secondary education where you can also access the teacher's room that gathers all the schoolteachers (from infant education, primary education, and even secondary education). When it comes to managing spaces, especially at times of maximum accumulation of children, such as playground hours or pupils entering and leaving the school, they are grouped into bubble groups to minimize contact between pupils from other classes.

Therefore, Primary children enter and leave in different school areas, as do Infants and Secondary children. On the other hand, the playground spaces are also diverse during the week (central playground, square outside the school, square near the school).

In general, it is a small school, but it has all the necessary spaces to guarantee a decent and exemplary education.

### **3.3.1. Groups of children**

To carry out the game created, four groups of the different cycle have been selected, in this case, the mid-cycle and upper cycle of primary school. The patterns of knowledge acquisition and cooperative behavior that the children develop during the game, previously designed, and elaborated, will be critically observed. However, it is necessary to consider what the class group is like and what limitations they present when learning. This is essential to understand the practical analysis results and adapt the game to the diversity.

In the third-grade class, there are 26 students (13 boys and 13 girls) who learn to coexist with children of different cognitive levels in the classroom. This makes group

management a complex task to carry out. I think it is essential to get to know and deal with all the children to understand what level of learning they are at and, therefore, adapt the contents to each situation. From this point on, the following cases of cognitive diversity of the classroom learners will be presented:

Within the third-grade class, several children have learning difficulties in the day-to-day classroom, reading and writing, and severe speech problems. That is why the teaching team, together with the parents, has to carry out individualized planning to adapt all the contents to the corresponding level of each child who needs it.

Among the children with difficulties there is a girl who shows signs of dyslexia in reading and writing. To correct some actions, measures are put in place to help this student who finds it more challenging to keep up with others. Two pupils in the same class have "high abilities," Therefore, the school needs to encourage motivation to avoid frustration at higher levels of schooling. Next, we find a child who presents high signs of Attention Deficit Disorder, which makes it difficult to follow an explanation and carry out activities requiring a lot of concentration. There is also a child who has speech difficulties which hinders him and makes communication difficult. Finally, there is a girl with down syndrome in the group who has a much lower cognitive level than the rest of the group, as she finds it very difficult to understand and reason about many subjects. In this case, she carries out activities specific to her level of learning. I consider it a very complex group to manage, both because of the number of difficulties and needs in the classroom and the significant difference in the class's pace.

It is essential that the children can manage themselves by taking into account where they can go and their limitations to progress at the right place. Because of this, materials should be provided that is adaptable to all.

In the fourth-grade class, there are 25 students (18 girls and seven boys) who learn and are educated in a diverse environment among their classmates. To manage this class does not require as much effort as with the lower grade class, as there are not as differentiated cases among the students.

Students with learning difficulties can be found in the classroom. There are three students, two of whom were not born in Catalan lands, who need extra reinforcement to improve their language and verbal expression skills. On the other hand, one of them has been given an individualized plan to help him achieve the learning better. He shows difficulties in speech, social relations, and especially in his learning pace, which is slower than the others. Except for these children, each student has their limitations and abilities

in the different areas of primary education, but they do not have any extra help like those mentioned above.

In general, it is a very quiet class with very integrated social values. We can work very well, respecting the different learning rhythms present in some activities.

### **3.4. Educational intervention**

#### **3.4.1. Development of the activity**

For the development of the educational practice, different groups were selected to play the game. In this case, a minimum of 12 participants was established for each game played, so there were two groups and two turns to play in each course. In this section of the project study, the practice events with each of the groups will be observed and written up. In this way, it will serve to analyze the results and give justification to everything in order to be able to extract a more critical analysis.

##### **Third grade (group 1)**

The first practice of the game began with the first half of the third-grade class. The children put on the circle and sat attentively as I explained to them what the big red and white box was all about. It was 3 p.m., and the atmosphere was more nervous than usual, so it was necessary to calm them down and explain all the basics. I showed them part by part the game while I was explaining the function of each thing, whether it was the board and how it worked, or the cards to be used at each moment, and finally, the cards with the questions corresponding to each organ. While I was explaining how the game worked, I noticed that they wanted to ask about possible strategies that came to their minds to check if they were correct or not. This meant dedicating a lot of time that, in the end, would not waste any playing time. We only had 20 minutes left to play between one question and another, so I decided to start the game to make the first contact and answer the questions during the game.

So, everyone lined up at the starting line and began to roll the dice one by one. As a result, all 12 pieces accumulated on the first squares, making it impossible for them to move around the board. On the other hand, they could only access the brain organ as it was the closest to the starting line, and they had problems during it as they were all going for the same organ. Another difficulty was the pace of the game. As they were not familiar with the contents of the human body, it was complicated for them to understand the

questions and answer them, and this meant that everything was very slow, as when a child rolled the dice, they had to wait for 11 turns to be able to move again.

Nevertheless, they had a great time with the questions and were very attentive to solve them. On the other hand, they worked as a team to strategize the game and learned words they had never heard before in English. They had a great time doing the quizzes, and every time they got the correct answer, they jumped for joy. The game could not be finished as with only 20 minutes, and it was not possible to make much progress, so we counted the number of pills that each group had put on the board.

Once I had played this first game with the game, I could modify aspects that I saw were difficult for the children to develop a more dynamic game. So, this first contact helped me see things that worked and things that didn't, and in this way, I was able to modify what was necessary to implement a much more suitable game.

### **Third grade (group 2)**

Once the first group had tried the board game for the first time, it was the second group's turn. They were a bit calmer as they had just had a lesson earlier and were more focused on learning. With this second group, we started at 4 p.m., and in this case, the board and the pieces were already on the table, as the children of the previous group had left them. As I couldn't give them an introduction to the game before they saw it, I decided to ask them about the subject of the game just by looking at the board. The children were eager to participate and wanted to discover how the game worked right in front of their eyes. I started to explain all the steps, the functioning, and the rules of the game, and at that moment, they began to ask about the strategies they could use, just as the other group did. This took quite a while, so by the time we started, 30 minutes had already passed.

Once everything had been clarified, I decided to start the game and resolve any possible doubts that might arise during the game. This time, I decided to place the counters of the participants at different starting points of the game so that they would not accumulate the counters in the starting box, and they could reach many more organs than in the previous group. Once all the counters were spread all over the board, the game started.

The children began to play and roll the dice one by one to advance the counters and reach the organs. This modification allowed the children to reach the healing zones earlier and answer a wider variety of questions related to the characteristics of the different organs. It also allowed them to reach the clover areas to get more fun strategy cards. Even though the children were able to go to all the organs in this group, the pace

was still very slow, and a long wait was necessary to roll the dice again, as this time, 13 players were interacting in the game. In addition, the level of knowledge of the specific contents of natural sciences was costly for them as they had not worked on them before, and therefore they had to think a lot to answer, and that slowed down the game a lot. The English level was not very high either, so a lot of translation into Catalan was needed to understand the content of the questions, but they were asked to answer in English, and they tried to do so.

The group's general attitude was excellent; they were willing to participate and answer the questions. In this second group, there was more dynamism as they went for many more organs and could access the clover cards much more quickly, which gave them a lot of motivation. However, as each member of the group had his or her piece and only moved his or her own, it wasn't easy to strategize, as everyone moved his or her piece without thinking about the other one.

Finally, one group got, thanks to a lucky card, a card that helped them to heal a whole organ, and therefore, they won the game. So, I was pleased because the modification I had proposed, had been successful.

#### **Fourth grade (Group 1)**

Once we had finished practicing the game in the third year of primary school, it was time to move on and try it out in the fourth year, to see if the level and pace of work were significantly different, corresponding to the age of maturity and the work on communication skills over a more extended period of time. So, as I did with the third-year group, I divided them into two groups to work with groups of about 12 or 13. Both in third and fourth grade, the groups were totally heterogeneous and diverse; therefore, it was possible to work with much more dynamism and cooperation to help each other.

This time the fourth graders were also very nervous about what was in the box. So I introduced them to the game piece by piece and explained all the steps, strategies, and rules involved in the board game I had created. From the questions they asked me from the very beginning, it was clear that they had perfectly understood the dynamics of the game and that they didn't have too many doubts, so we started with the game, and I used the same modification that I did with the second group of third-graders; placing them in different points of the circuit of squares.

At this point, I came up with another possible modification to carry out, concerning cooperation and working on game strategies and the slower pace of play. So I proposed

to keep the groups of 2 and 3 members, but to make it more dynamic, only one from each team would shoot, and they would change in each round. Therefore, only six rolls were made, instead of 12 or 13 per round. And another of the modifications I made was to roll again if the dice rolled six so that they could move around the board much more quickly and get to all the places they wanted.

They started to play with a lot of enthusiasm and motivation as they found the game very attractive. What surprised me was that they started to define the strategies to advance to other teams. During the course of the game, they showed a very good cooperative attitude, helping each other in the activities. It was noticeable that they had a higher level of knowledge about the topic. Moreover, they did not need translation; they understood all the questions very well and solved them in the target language, in this case, English. The dynamic was very good, and they achieved the objective of the game. They managed to win the organs with plenty of time to spare, and we were even able to start a new game that they had left halfway through due to lack of time. They had a great time and understood very well how the game and the rules worked. They used many strategies that allowed them to win the pills they needed.

#### **Fourth grade (Group 2)**

Once the first half of the fourth-grade class had played the game, it was the turn of the second half, who was very excited to see what they had prepared. This time, just like the second group of the third year, they already had the board and the pieces on the table. So instead of introducing it myself, I decided to ask what they thought they would do in the next hour. With a lot of knowledge, all of them immediately answered many of the concepts we would be working on, and some even went a bit further, telling me how each organ worked.

Once we had brainstormed, I started to explain the dynamics of the game, how they had to answer the questions, what language they had to use to express and communicate, and the general rules they had to respect when it came to their group game strategies. Once everything had been explained, they started to play as there were practically no questions.

The game worked very well in many respects, both in terms of cooperation between the groups and in answering the questions correctly. As in the previous group of fourth graders, the children showed a high level of comprehension of the English language and a lot of knowledge about the topic. In this case, all the modifications that had been carried

out previously fitted perfectly with the group, and therefore, nothing else needed to be changed.

They were able to finish the game without any problems, and we still had time to start another one. They left the session very happy and looking forward to playing again as they kept repeating it repeatedly.

### **3.5. Results and discussion**

#### **3.5.1. Criteria observation indicators**

To observe the participation in the classroom and the development of the game in a real environment, we have created a series of specific rubrics designed to observe a particular aspect of the intervention. On the one hand, the indicators and rubrics will be shown in relation to the knowledge and learning of the two areas worked on by each child (competency rubric). Then, another rubric has been designed to analyze the classroom dynamics and the children's behavior in the cooperative work environment (application rubric). And finally, another rubric was created to observe and analyze the composition of the game, i.e., whether it is adequate and correctly created. Each of the rubrics created has its indicators that will be explained below.

On the other hand, all the observation results during the intervention will be collected with the rubric. In this way, the difficulties and modifications mentioned in the description of the development of the intervention of each of the groups will be reflected. Once the indicators have been contrasted with the real practice of the game, the responses, and observations that the children have experienced during the game will be analyzed. In this way, it will be possible to see if the results coincide or not to make them more truthful and focus on the opinion of several subjects.

##### **3.5.1.1. *Technical game rubric***

In order to be able to analyze and observe whether the educational practice is adequate and works correctly in the environment in which it is implemented, it is necessary to observe and evaluate the material that is proposed and on which most of the practice of this project is based. Therefore, it is essential to thoroughly analyze the game to detect any errors in the creation and design of the game. For this reason, a rubric has been created to examine the components of the game and to see if, in the end, they are

adequate to respond to the initial hypothesis: to see if a board game created by me can guarantee favorable learning of two very different subjects (English language and the natural sciences of the human body).

To carry out the game analysis, 13 indicators related to the game, its creation, the design, and the development of the practice have been specified. These have been specified from the beginning and modified during the creation of the game to analyze all those aspects that I have asked myself and that through practice, I will be able to analyze whether or not it is suitable for the practice with the children. To measure these indicators, four levels have been defined, ranging from 1 to 4, to determine from less to more the suitability of the contents planned for the game. In this case, it is specified from less to more in accordance with the established statement. Once the affectivity of the game has been specified, a comments section has been added to facilitate the clarification of those terms that are preferred. The indicators and the rubric can be seen below.

<b>TECHNICAL GAME RUBRIC</b>					
	<b>Level 1</b> <i>(disagree)</i>	<b>Level 2</b> <i>(neutral)</i>	<b>Level 3</b> <i>(agree)</i>	<b>Level 4</b> <i>(highly agree)</i>	<b>REMARKS</b>
<b>1. The instructions of the game are clear and adequate.</b>					
<b>2. The game is suitable for the established number of participants.</b>					
<b>3. The game has many squares to play.</b>					
<b>4. The arrangement of the organs is correct.</b>					
<b>5. The game is well created to develop game strategies.</b>					
<b>6. The routing of the square is good to reach all organs.</b>					
<b>7. Organs have few squares to be cured.</b>					



8. The cards are well ordered and well designed.					
9. The questions are appropriate to the children's knowledge.					
10. The questions are well formulated in relation to each organ.					
11. The game helps to learn specific natural science content.					
12. The game helps to develop communicative strategies in the English language.					
13. It is an easy game to understand and play.					

*Table 1: Technical game rubric*

### **Rubric results**

Once the indicators set in the technical rubric of the board game are clear. After making an application in a natural context, all the essential points of the table will be analyzed to check whether the results are optimal.

To begin with, the answers to thirteen different indicators selected before carrying out the actual game will be given. The above rubric is part of the observation of all groups of children (both third and fourth grade) who have participated in the game regarding the development of skills they have shown during the game practice.

First of all, we focused on the instructions given to the children, which were considered correct and appropriate for the ages of the participants. These were done orally and very visually to allow them to relate the actions that the teacher told them about with the materials they were going to perform their moves. However, not all the strategies were explained to guarantee the creativity and logic of the children when creating their movements. In this way, any displacement was allowed, giving a lot of autonomy and freedom to the children.

The number of participants in a game is also analyzed, since it is recommended not to exceed 12 players but not less than 4 participants. This way, it is possible to play

cooperatively, which we want to promote in this board game. However, a difficulty has been observed in the number of participants, since in many cases, when shooting one by one, the game became very slow, which did not allow to reach the objective. One participant commented on this in the final questionnaire, and it was immediately modified. The participants' name was kept, but only one person per group and round was allowed to shoot. This significantly increased the agility of the game, allowing for a much more dynamic game.

Then, once focused on the indicator of the number of squares, it is considered to be suitable and adequate to the type of board game being played. For the magnitude and the great variety of strategies that can be used, it is necessary to have a coherent number of squares; in this case, the game has 63 outer squares to move. But taking into account the number of players and that some moves can be made six squares at a time, it has a lot of variety and allows complete freedom of movement.

On the other hand, the order and design of the organs and cards are adequate and focused on being as realistic as possible since the objective is to create a coherent image in the children and therefore safe sources have been consulted to develop and design with maximum rigor all the necessary materials for the game.

As mentioned above, the game has been created to develop good cooperative strategies between the teams and to be able to reach all the necessary parts of the board successfully. For this reason, the organization of the squares and the number of squares have been considered.

Regarding the indicators that mention the coherence of the questions created and adequate to the children's knowledge, it is considered that they are. They have been made with maximum rigor to develop optimal comprehension skills to understand the questions perfectly. However, when we relate the questions to the participants' appropriateness, it can be challenging to adapt each one to each different child. In some cases, there are responses from children in the third grade of primary school about not understanding the questions very well because of the lack of specific information and the poor language skills of some children. Therefore, in these cases, the teacher must intervene and modify or express with gestures what is being asked to facilitate the understanding of children with learning difficulties. However, it has been verified through the children's answers that the great majority of them have learned new things during the game; therefore, we can say that all the specific content can be ideally acquired by a child of the ages of the participants since it is easy to understand and brings you closer to the English language to develop communicative strategies.

**3.5.1.2. Application rubric**

This rubric includes all the indicators related to the analysis of the cooperative work that takes place during the game, the attitude and predisposition shown by the children, the values that can be extracted from the practice, and, above all, how they move and react during the game.

This table has a total of 12 different indicators around the theme of attitude during the game. To analyze these indicators, the whole group and the surrounding atmosphere will be considered, as the practice is observed at the moment. To be able to measure the degree of each of the objectives set out in the rubric, four levels have been created to be able to adjust as far as possible the degree of fulfillment of the group. These levels range from 1 to 4 and measure the partial or total fulfillment of the indicators. In this case, for example, level 1 is suitable for a group of students who do not fulfill the selected requirements and therefore show a poor attitude in many aspects. And, on the contrary, level 4 is aimed at a group of students who have good cooperative and attitudinal values and work together to learn.

Finally, we can see that there is a comments section that will be useful when pointing out aspects that justify the level of learning of each indicator; therefore, it will be very important to specify the level well so that it can coincide with the comments provided by the teacher observing the practice.

<b>VALUES AND ATTITUDE, CLASSROOM WORK, AND COOPERATIVE HABITS ASSESSMENT</b>					
<b>GROUP __</b>	<b>Level 1</b> <i>(poor)</i>	<b>Level 2</b> <i>(sufficient)</i>	<b>Level 3</b> <i>(sometimes)</i>	<b>Level 4</b> <i>(a lot)</i>	<b>REMARKS</b>
<b>1. Pay attention to the teacher's explanations.</b>					
<b>2. Ask questions to clarify doubts.</b>					
<b>3. Work cooperatively with the partners.</b>					
<b>4. They use gaming strategies.</b>					
<b>5. There is a good communication</b>					

between the participants.					
6. Good feedbacks emerge during the game.					
7. There is respect among the players.					
8. They easily understand the dynamics of the games.					
9. There is a learning progress during the game.					
10. They help each other.					
11. They use English to communicate ideas.					
12. They know the specific vocabulary that appears in the game.					

*Table 2: Application rubric*

### **Rubric results**

To collect all the results concerning the application rubric, the observation has to be divided between the two primary school classes in which the practice of the game has been carried out. This is because it is essential to compare the behavior and dynamics of one class group with the other and the previous knowledge of the children and the cooperative capacity they develop during the game.

In the rubric of the third-grade children, we can see how they pay a lot of attention to the indications given by the teacher, since they feel motivated to play the game presented to them and therefore, they concentrate a lot on listening and understanding the premises. Then, they are very participative in the resolution of doubts that arise when they start to think about possible strategies to carry out. However, at the beginning of the game, they have difficulties working cooperatively since each one moves his own piece, and therefore they do not generalize game strategies to move forward.

They are able to generate excellent feedback and clearly understand the functioning of the game through the games. Still, the learning process during the game is challenging to visualize, especially in children who have difficulties, as they may not have understood many concepts and still do not understand them because they do not want to consult them. It isn't very easy for them to maintain communication in English since many of them expressed that they did not understand the questions and needed translation into Catalan. One of the barriers that the children could find is the specific knowledge that the game dealt with since it had not been previously worked on, and it was more difficult for them to understand it in English. Even so, they had a good time and learned new things they did not know.

In the rubric of the fourth graders, we can see how there is much more progress in learning. In general, they do not show difficulties in understanding the game dynamics as they pay close attention and are curious to questions that are not very important. One of the most positive things demonstrated by the students in both halves of the fourth grade was the social skills and cooperative work they developed. It allowed them to create game strategies and have excellent communication between them to reach their goal.

On the other hand, the specific content presented to them had already been worked on at some point in their schooling and, therefore, showed very significant progress because once they were clear about the content, they learned it in English and had more ability to communicate it. And thus, fluent communication in English was much more optimal than in the third-grade group. In addition, many of them expressed that they learned in depth the characteristics of the organs that they did not know before, and that, just by playing.

### **3.5.1.3. Competency rubric**

Within the competency rubric, a few indicators will be helpful to take into account when observing the children individually. In this case, two different tables have been created since the children's skills will be analyzed in the two areas worked on (English language and natural sciences of the human body). In order to extract equivalent results, the same skills have been analyzed, and four levels have been set that are equivalent to each other.

In the left vertical part, we can see the four communicative skills that need to be acquired to create a fluent conversation in a foreign language. In this case, listening, speaking, writing, and speaking are the most important skills to be used in the game. To measure

and analyze the acquisition of these skills, four different levels (1, 2, 3, 4) have been created (1, 2, 3, 4) that go from less skill to more, and that reflect the ability that the child presents according to the fulfillment or not of the established objective. The closer the child gets to the objective, the higher the level he/she will be able to achieve. According to the area being analyzed, the established objectives change according to the skill and, above all, according to the area being analyzed. In the English language rubric, the skills related to language and linguistic production will be observed, while in the rubric for the area of natural sciences of the human body, the content and specific vocabulary of the area will be analyzed. Each of the observation tools can be observed below in order to see each of the indicators established for the analysis of classroom practice.

<b>INDIVIDUAL ASSESSMENT RUBRIC (<i>English Language area</i>)</b>				
<b>Learner __</b>	<b>LEVEL 1</b>	<b>LEVEL 2</b>	<b>LEVEL 3</b>	<b>LEVEL 4</b>
<b>READING</b>	Presents difficulties in reading and comprehension of text.	Presents difficulties in reading but understands some words of the text.	Presents good reading skills and understands most of the words.	Shows fluency in reading and understands most of the words.
<b>LISTENING</b>	Presents difficulties in understanding and needs translation.	Presents difficulties in understanding some of the speech.	Presents the ability to comprehend much of the speech.	Presents easy comprehension of the speech.
<b>SPEAKING</b>	Presents difficulty communicating in English.	Presents difficulty communicating in English but names isolated words.	Presents difficulty to put isolated words into a sentence.	Presents the ability to construct short and simple sentences.
<b>WRITING</b>	Does not have the ability to write words.	Presents difficulty to write simple words.	Presents the ability to write simple words but shows difficulty to write complex vocabulary.	Presents the ability to write simple and complex words.

<b>INDIVIDUAL ASSESSMENT RUBRIC (<i>Natural Science area</i>)</b>				
<b>Learner __</b>	<b>LEVEL 1</b>	<b>LEVEL 2</b>	<b>LEVEL 3</b>	<b>LEVEL 4</b>

<b>READING</b>	Has difficulties in understanding specific vocabulary.	Knows the basic specific vocabulary but has difficulty understanding the information in the text.	Knows the basic specific vocabulary and understands the information in the text.	knows the specific basic and advanced vocabulary within the text.
<b>LISTENING</b>	Difficulties in understanding and needs definition.	Understands simple words of basic specific vocabulary.	Understands basic specific vocabulary words and some advanced words.	Understands basic and advanced specific vocabulary.
<b>SPEAKING</b>	Lacks the ability to use specific basic vocabulary appropriate to the speech.	Uses some specific words but in isolation.	Has a good base of specific vocabulary but finds it difficult to put it into a sentence.	Good base of specific vocabulary and good communication skills.
<b>WRITING</b>	Does not recognise the right word when writing.	Recognises the right word but is not able to write it in English.	Recognises simple words but struggles to write complex words.	Uses the right word in context whether it is simple or complex.

*Table 3: Competency rubric*

### **Rubric results**

As explained above, this competency rubric is directed to analyzing and observing the practice and individual development during the game. To have an overview of the level of skills presented by the children in each grade concerning the two areas worked on, a brief compilation of the results will be made, dividing the groups, to understand the intervention carried out.

In third grade, we can observe how the great majority of the children present difficulties to develop a communicative skill during the game; this is due to the lack of knowledge regarding the English language area, which causes them problems when expressing themselves in the target language. On the other hand, the basic specific knowledge that appeared in the game regarding the natural sciences of the human body, there are many gaps in knowledge and understanding about the content.

On the other hand, in the fourth grade, there is a general visualization of a good base of English language that allows them to express and communicate in the target language. There is a greater understanding of the information, and they show good skills. Concerning the basic knowledge of the specific vocabulary of natural sciences of the

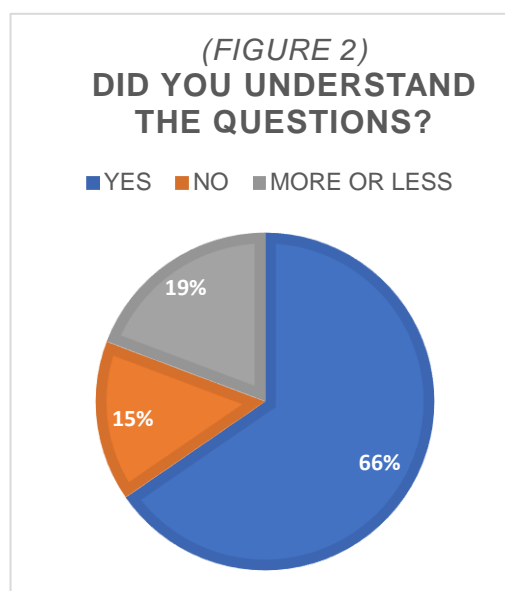
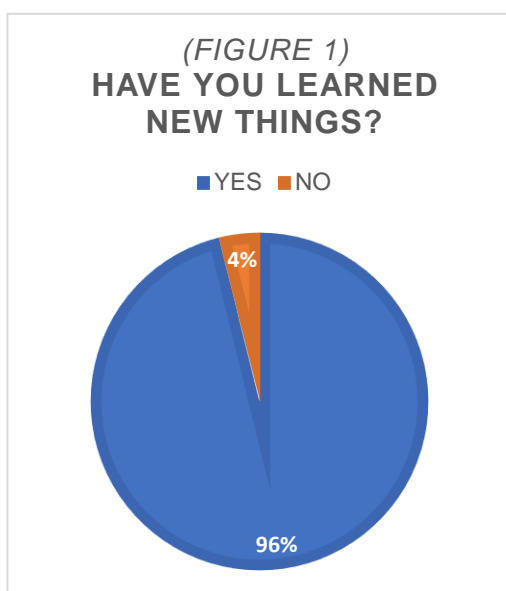
human body, good development of the simplest knowledge of the area is observed. This allows them to expand this knowledge and thus broaden the skills that connect with the area.

### 3.5.2. Students' comments

In this section, we will collect all the children's answers concerning a survey made to them in written format to collect their external opinions regarding the game and their experiences during the practice. To obtain more specific results for each group, particular graphs have been made for the third and fourth groups.

#### Third course graphs

In the collection of answers that the children have provided in the study, they have been grouped in graphs to visualize the study results more clearly. These graphs, attached throughout the document, are the grouping of all the opinions of the third-grade group, regardless of the subgroup established. Firstly, we can see in (*figure 1*) that 96% of the participants claim to have learned new things while the remaining 4% have not expanded



their knowledge. On the other hand, we can see in (*figure 2*) that 66% of the children understood the questions well; nevertheless, the remaining 34%, of which 15% did not understand them and 19%, understood them more or less.



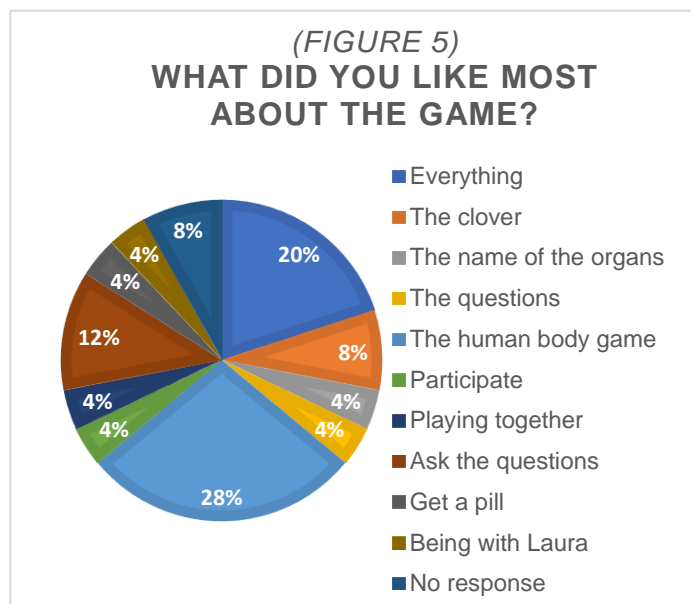
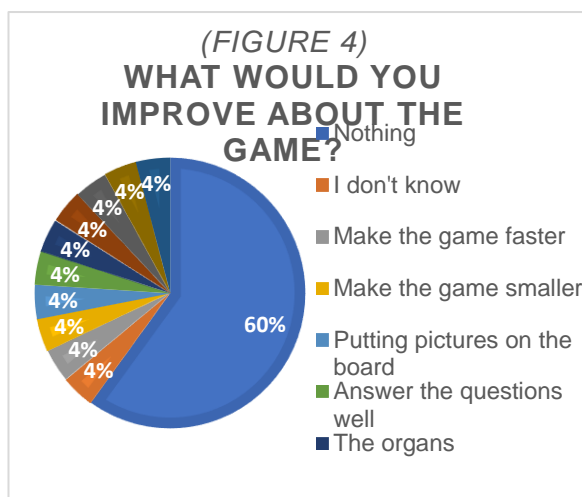
Next, analyzing (Figure 3), we can see that in response to the question "Do you think you learn more when you play?", a large majority, precisely 88% of the children, answered affirmatively, while 12% said no, once the practice had been carried out. Next

to this graph, we can observe (figure 4), which corresponds to the question "what would you improve about the game?". In this part of the survey, being an open question, we have collected a multitude of different answers that have been considered when making the appropriate modifications. 60% of the responses have been not to improve anything of the game, and they have clarified that they like it just as it is, with its rules and strategies. On the other hand, we can see a multitude of recommendations such as speeding up the pace of the game, making the board a little smaller to reach the pieces, or not allowing the elimination of the pills of the other teams. These multi-answers each make up 4% of the total.

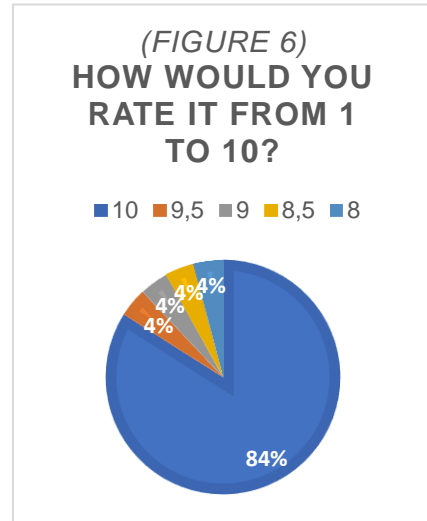
Finally, in the last two graphs, there are two interesting responses for the project.

Firstly, (figure 5) shows the results of the question "what did you like the most?" where we find many very varied answers among the surveyed sample.

The 28% of the responses were the game that I presented to them, others responded with a 20% of final results, that they liked everything; however, we have very interesting answers such as a child who answered that he enjoyed participating in the game, playing all together, the clover squares and others the questions.



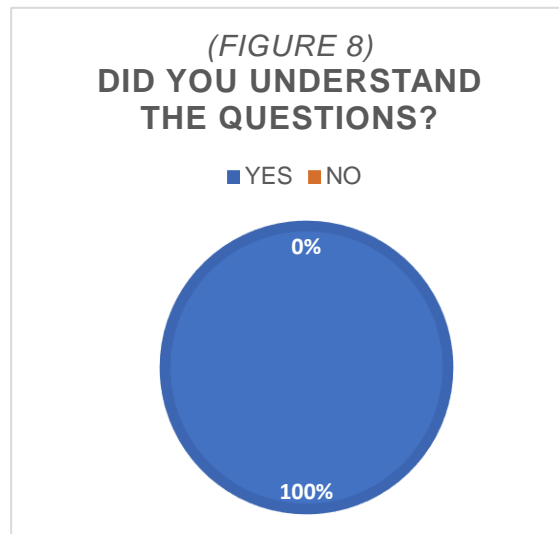
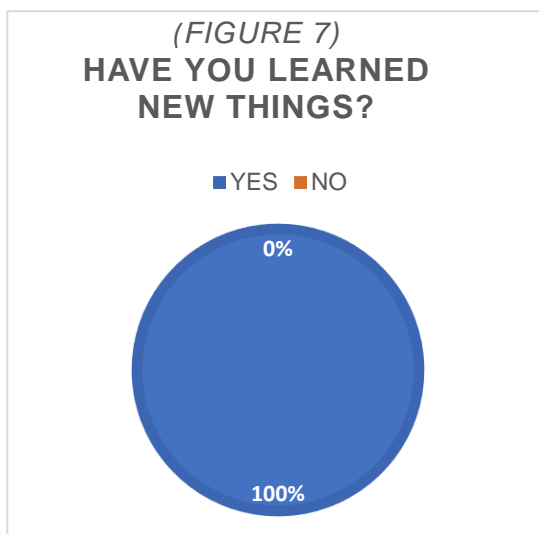
And finally, the last question (*figure 6*) in the children's survey was "How would you rate the game from 1 to 10?" and 84% of the children's results were a ten, while 16% rated it a 9.5, 9, 8.5, and 8 (each with 4% of the total).



#### Fourth course graphs

In this next section, we will collect the results obtained from the fourth-grade class grouped indifferently from the subgroups made at the time to develop the board game. The survey questions are the same as those asked in the third grade to compare the results in a more meaningful way.

In the first place, we find the first two graphs corresponding to (*figure 7*) and (*figure 8*) in which we ask if the previous knowledge has been expanded concerning the game and 100% of the answers have been positive. By understanding perfectly, the specific vocabulary, they have been able to learn new things. On the other hand, in the other figure, we can see that 100% of the children who participated understood the questions very well since, in general, the linguistic level was higher than that seen in third grade.

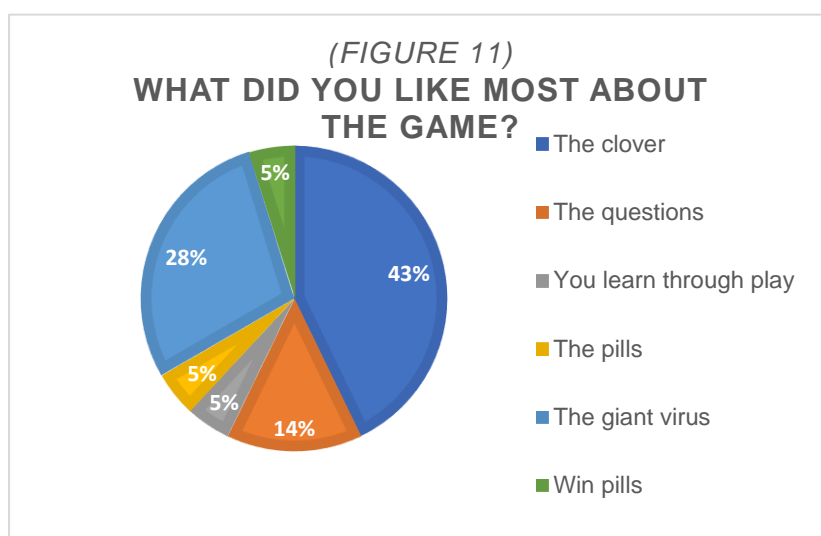
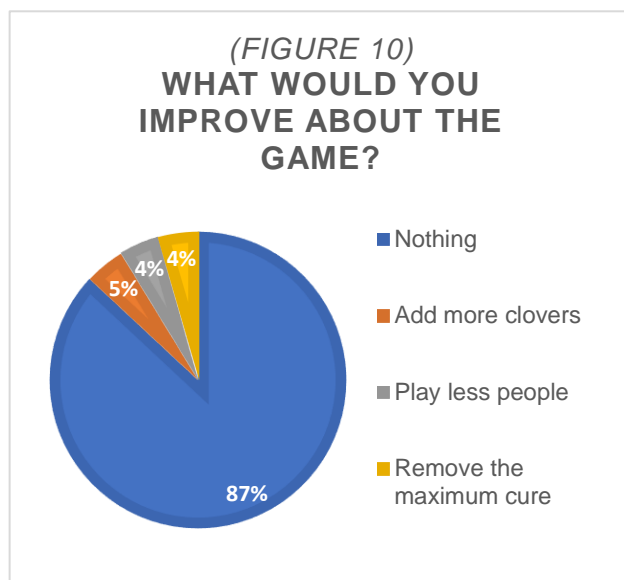
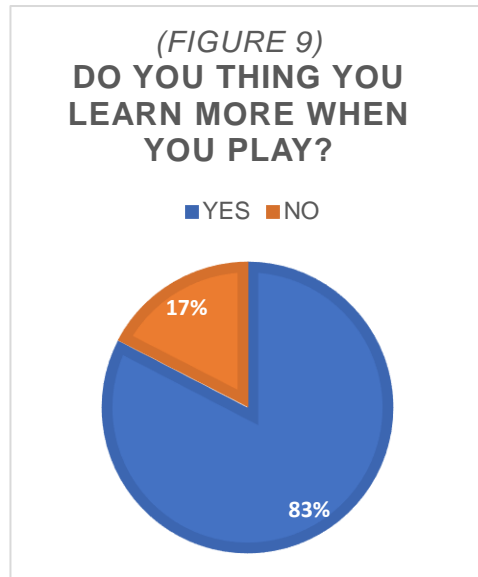


Continuing with the analysis of the graphs' results, we can see that in (figure 9) the question "Do you think that one learns more by playing?", the great majority, 83% of the answers said yes. In comparison, 17% of them said no, since they believe that they learn with other methods in their own experience. Next to it, we can observe the graph (figure 10) where we can see the children's recommendations to improve the game. Eighty-seven percent say they do not want to improve anything, while the remaining 13% propose reducing the number of players, creating more clover squares, and removing some cards that favor those who play them.

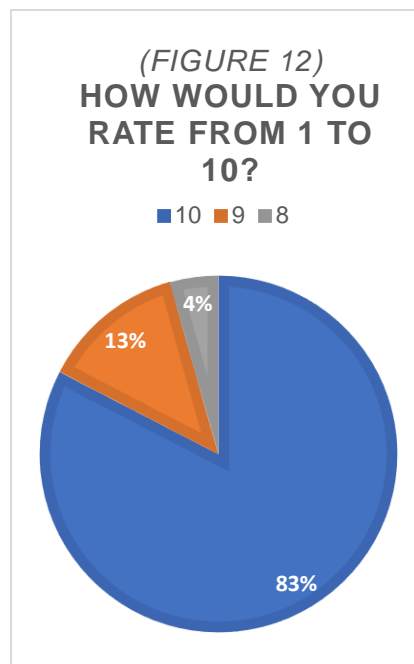
Finally, we observe the last two graphs referring to the questions answered by the children.

In (Figure 11) we can see what the children liked most about the game, and the results were 43% voting for the squares and clover cards. With 14% the questions, with 28% the cards with virus and others like

winning the pills with 5%, playing learning with another 5% or the pills with another 5%.



And in the last question is the graph corresponding to the final grade that the children consider appropriate to put on the game. With 83% of answers, the children thought a 10, 13% believed a nine, while 4% would give an 8. Compared to the responses of the third grade, there is less variety in the ratings and more concentrated votes.



## 4. CONCLUSIONS

Board games can bring a lot of learning, both content-specific and attitudinal, which can significantly improve school-age children's cognitive and emotional development. As has been pointed out in the project, motivation is a fundamental part of capturing children's interest and making significant learning retention.

As initially stated, the main objective of this study was to find out whether the design and creation of a board game aimed at CLIL learning could meet all the characteristics required to provide the necessary meaningful knowledge in a real classroom and context. As we have been able to see in the results, through the indicators established before the intervention, the technical part of the game complies with the dynamics of the game. Therefore, it is well studied so that the children can develop easily. On the other hand, the dynamics in the classroom have been very positive in many aspects since it has allowed the children to learn new things and have fun at the same time. And not only have they learned specific vocabulary in the area of natural sciences, specifically about the human body, but they have also learned to cooperate, to help each other, to build strategies to move on the board, and above all, to have a much more respectful attitude.

The effectiveness of board games can be very high in many cases for daily learning in the classroom. As it has been verified, children show great satisfaction when playing; they are interested in learning. Their positive attitude favors the game environment. Most children affirm that they learn more when they play than in a different environment, which shows that all the implications and innovation when creating a game that requires suitable materials have been very significant for them.

In the development of the project, there have been some limitations that have hindered at times the work that was planned to be done.

One of the first limitations that were experienced when carrying out this project was the creation of the game materials. At first, the idea was to create it using environmentally friendly materials; therefore, the intention was to use only wood, cardboard, and paper. In no case was it going to use plastic because it can be a very aggressive material for the environment and can also serve to show a lesson to children and teach them that you can also make things without the need for plastic. However, this first conception had to be eliminated when developing the material for the game. Taking care of the environment is not an easy task since we live in a liquid society where we want things fast and easy.

When it was time to collect all the materials, we had complied with what had been established at the beginning. However, when it was time to print the game cards, we consulted with professionals in the sector, all possible information to print them in cardboard format to be resistant to the fast hands of children. The cost of printing and manual work of 277 color cards was too high, as it requires different steps to cut and paste the cardboard to size. At this point, I realized that the first intention to do it with environmentally friendly materials had to be modified. So, the second option was to print it on paper and then laminate it. It was not as ethical an option as initially proposed, but I had to adapt to the setbacks and limitations.

Another difficulty and limitation encountered during the project was the intervention at the school. The school was very eager to bring the game to test it in some course since it was an innovation that could be interesting for other center projects. It was agreed to make the interventions in the third and fourth-grade classrooms to see the evolution or possible changes from one year to the next. It was decided that all the interventions would be carried out during one afternoon, both in third and fourth grade.

To my surprise and being the first time, I was teaching it in a real environment, the game's timing was not what was expected, and each half of the third-year group took an hour to play the game. Therefore, I only had time to test the game with the third-grade group. After talking it over with the teachers, we set a date to come again another day at the center and try it, this time with the fourth-grade group. As expected, and taking into account the timing of the previous groups, they also took an hour for each half of the group.

Once the implementation was finished in the third and fourth-year classes, it was proposed to me to teach it in both the fifth and sixth year to see the change from one

cycle to another. I thought it was a great idea, so I accepted, however, we could not find a time to come because being at the end of the course, they had a lot of work to do. Days went by, and every time I had the feeling that I was not going to be able to do it. So, for time and thickness of content, I ended up saying no, since the analysis of the two courses was very extensive and required a lot of time, and in this case, I did not have to be able to do it in another cycle and therefore with four more groups.

Apart from these limitations during the project, there have also been others that I consider less essential to highlight, such as the creation of the children's response graphs, since the program's numbering and tables were complex to understand, and I required external help to create them. Another limitation was when creating the observation rubrics since, at the beginning, the objective was to analyze the children's progress. However, the most important thing was to analyze the board technically and especially the children's attitude, so I had to create rubrics that fit more with the established objectives.

Another constraint experienced during the course of the project is the reality of society in the current year. Because of the pandemic, everything has been a bit more complicated. The interactions in the game could not be of more than two people to avoid any contagion. The same person always took the material in the group, and the protocols established by the center had to be followed.

And these were the limitations that may have occurred during the course of the project.

Another thing I wanted to mention to conclude the document is the improvements that I personally could modify in the future to guarantee the maximum quality in the board game created.

First of all, and after having received the children's responses, I would change aspects such as the number of participants in the game, to be able to play with reduced groups, to have more possibility of participation and movement, in this way, it would be easier to carry out a quick dynamic and to be able to focus on joint learning. In addition, I would also like to improve aspects such as the plastic that has been mentioned before, to be able to create the cards with resistant cardboard so that the children can manipulate it without any problem.

I would also like to have a little more time to be able to explain the instructions calmly, that the children had more time to play and that there were a little more possibility for everyone since once a group won, the game had to end because there was no time for more.

This project has been created to discover a different methodology to what we are used to seeing and applying concepts in the English language when I have the opportunity to teach in a classroom. I wanted to innovate in education, creating from scratch a game that would be useful for me in the not-too-distant future, being an English language teacher in a school.

At the beginning, I saw it impossible to be able to create a board game, previously not invented, to be able to apply all the necessary characteristics to be an educational game within reach of children and thus, to allow the acquisition of the required knowledge of specific vocabulary. For me, it has been a great challenge that I would never have imagined realizing.

At this point, having finished this last big project that requires the degree of primary education teacher, I can say that I see myself ready to face any difficulty along the way. One of my great personal motivations is to change an education established by repetitions and established exercises for a broader concept of education. To be able to provide children with the necessary tools so that each one can demonstrate their abilities and share them with others. To treat the learning of a foreign language as an opportunity to expand communication strategies, feel comfortable expressing themselves, and be interested in learning it. That is why my main goal was to create something that would help in educational innovation, and this is the case of the CLIL board game. Now that it is finished, I feel proud of what I have been able to achieve.

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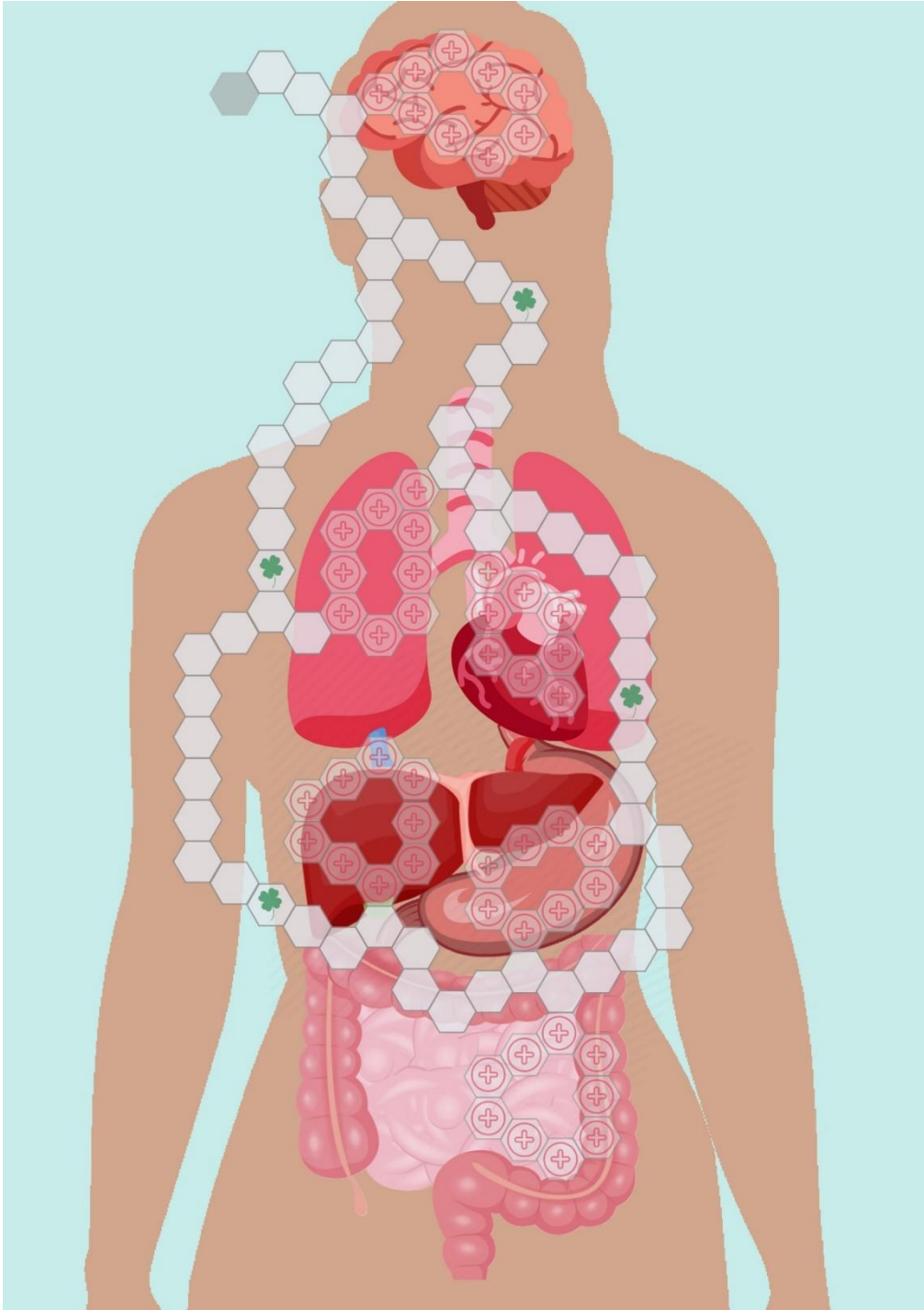


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## 6. APPENDICES

### 6.1. Board of the game

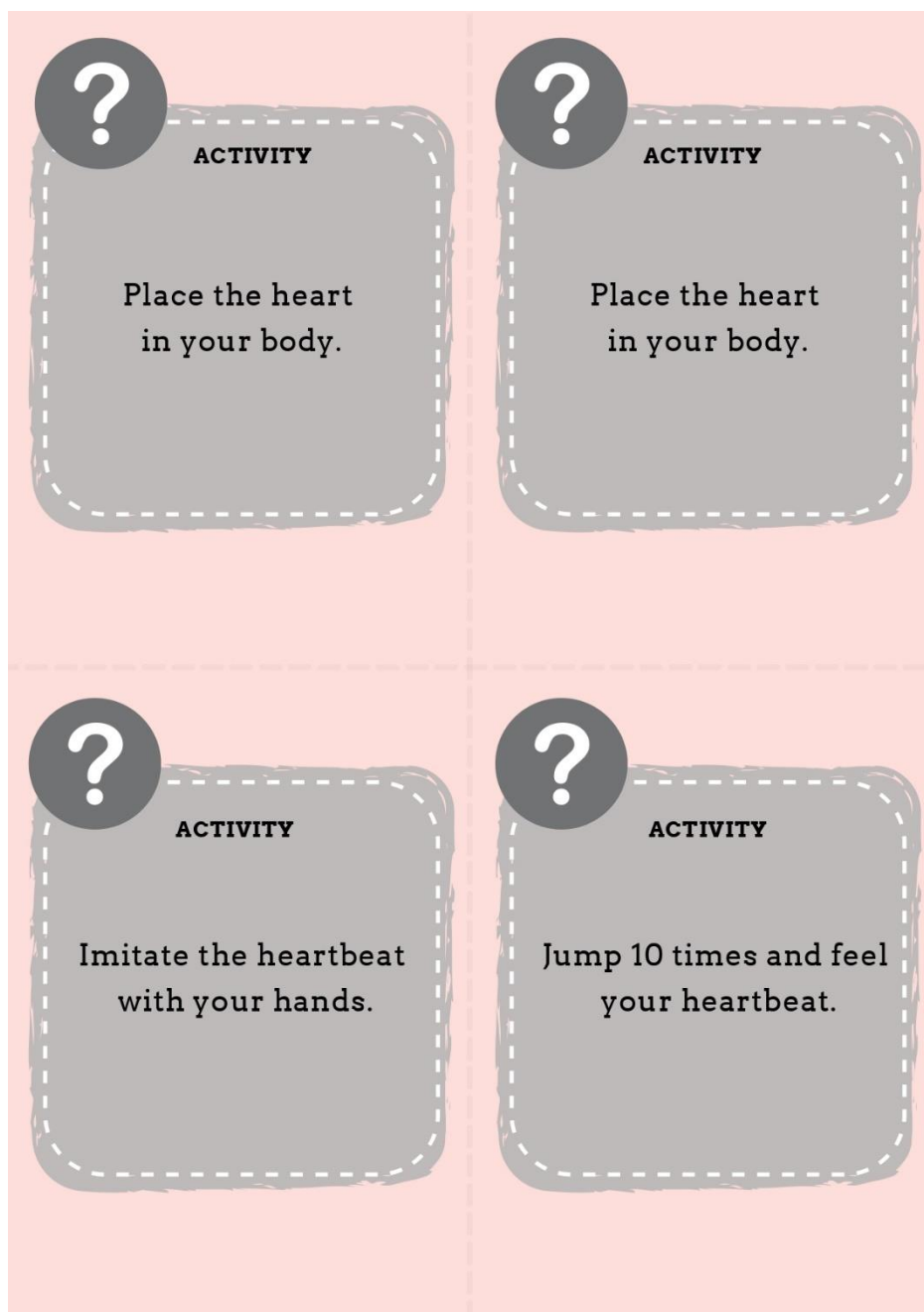


## 6.2. Game cards

In this section, you will find a compilation of cards of the game in order to understand the type of questions and see the design created. There will only be about 16 (8 for each type of cards) of the totals of 277 cards.

The pink and gray cards in the game belong to the question group, while the green cards are the trefoil cards. The latter have different functions: to move forward and backward, win pills, and eliminate pills from the opposing teams.

### 6.2.1 Question cards and clover cards





**ACTIVITY**

Place the heart  
in your body.



**ACTIVITY**

Place the heart  
in your body.



**ACTIVITY**

Imitate the heartbeat  
with your hands.



**ACTIVITY**

Jump 10 times and feel  
your heartbeat.

