



FACULTAD DE EDUCACIÓN DE PALENCIA
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GAMIFICATION: A NEW APPROACH IN EDUCATION. ITS IMPLEMENTATION IN A FINAL TASK.

GAMIFICACIÓN: UN NUEVO ENFOQUE EN EDUCACIÓN.
SU IMPLEMENTACIÓN EN UNA TAREA FINAL.

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ABSTRACT: This study aims to define what gamification is and what it has to do with ICT and New Technologies within an educational system. Additionally, it presents the different aspects within gamification in order to implement them in the classroom. Through those aspects, this study offers an example of gamification experience within a classroom which can be analyzed and adapted to any other stage or school, so teachers can start using new methodologies based on a gamified system and also on their student's motivation and interests. Definitely, this study analyzes and sets the essential keys for the establishment of a gamification system based on the interests and motivation of the students, working with their multiple intelligences and emotions in order to achieve a meaningful learning process.

KEYWORDS: Gamification, Gamified System, New Technologies, Games, Classroom Environment, Motivation, Creativity, Multiple Intelligences, Emotional Intelligence, Emotions, Problem Solving, Escape Room.

RESUMEN: Este estudio pretende definir qué es la gamificación y cómo está relacionada con las TIC y las Nuevas Tecnologías dentro del sistema educativo. Adicionalmente, presenta los diferentes aspectos de la gamificación para poder implementarla y llevarla a cabo dentro del aula. A partir de estos aspectos, este estudio ofrece un ejemplo de experiencia gamificada dentro de un aula, que puede ser analizada y adaptada a cualquier colegio o nivel, y que permitirá a los docentes empezar a usar nuevas metodologías basadas en gamificación y sistemas gamificados, todo ello relacionado con la motivación y los intereses de su alumnado. En definitiva, este estudio analiza y establece las claves esenciales para el establecimiento de una metodología gamificada en las aulas, basada en los intereses y motivaciones de los alumnos, mientras se trabaja con las inteligencias múltiples y con la inteligencia emocional para conseguir que tengan un proceso de aprendizaje totalmente significativo.

PALABRAS CLAVE: Gamificación, Sistema Gamificado, Nuevas Tecnologías, Juegos, Ambiente del Aula, Motivación, Creatividad, Inteligencias Múltiples, Inteligencia Emocional, Emociones, Resolución de Problemas, Aula de Escapismo.

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1. INTRODUCTION.

It is the time for a change: a change in education. The future has come to what we are living today and it's about time education changed the way it is implemented in our students. It has been already changing recently, these past years have been full of changes in the law, in the schools, in the different subjects and teaching models... Has anybody wondered about how all those things affect our students? Are teachers and professionals of education doing the right thing?

The answer to these questions can be varied depending on what the person who answers focuses on. What it is clear is that, with all these changes and tries to make things work within the schools, teachers are forgetting one of the key factors of education is: create a comfortable and nice environment for the students that allows them to have a meaningful learning process based on happiness and motivation.

Nowadays, more and more teachers are realizing that children need to be motivated in order to learn, and that fact is only possible if we base their learning process on their interests and emotions. The old education model is behind the times and a change needs to be done in order to achieve the aims that the new model of education is asking for.

In order to get this meaningful learning process for our students, there is a tendency that has already consolidated within many schools around the world and which many teachers have put into practice in their classroom. This is gamification.

Thanks to gamification, motivation and creativity are taken to the learning process, incorporating techniques and elements from games. It is a process that allows the relationship and interaction between teachers and students to be rich. That fact has got many benefits such as the improvement of the classroom environment, which makes the students learn from their teachers, feeling themselves as the main part of the learning process. When this occurs, there are many opportunities of feedback to the students, allowing them to be aware of what their mistakes are and how they can improve more.

Gamification achieves a great participation of the students within the classroom; they follow the dynamics and activities going at their own pace, so their learning speed is respected from

the very beginning without forcing learning situations. This situation is what provides quality of learning, providing the students with tools and techniques to overcome any obstacle.

This study tries to get new education models back on track, so teachers are able to implement them within their classrooms. Using gamified systems provide students tasks which are meaningfully designed, developed and evaluated. This fact allows the students to be participative, to be willing to learn and to experience within the classroom. It makes them to be motivated and creative whilst they have the best possible learning process, full of knowledges and educative situations.

2. OBJECTIVES.

This study aims to achieve the following goals:

- To define what gamification is and what its bases are.
- To get to know different aspects about gamification.
- To promote innovative educational models and dynamics to implement within the classroom.
- To present an alternative experience based on gamification.
- To develop multiple intelligences and motivational models within the classroom based on gamification.
- To analyze a gamified experience developed with students within the school.
- To contrast the results of a classroom obtained after having a gamified experience.

3. JUSTIFICATION.

“Nowadays, creativity is as important as literacy, and it should be treated with the same status. Children are educated out of creative capacities due to mistakes are stigmatized. Kids are frightened of being wrong.” (Ken Robinson, 2006)

The previous statement was said by Ken Robinson in one of his talks in TED Talks (Technology, Entertainment and Design) and it sums up the exact purpose of this study. Nowadays, there are many students within the classrooms who are not motivated enough, scared of making mistakes and not interested in education as it currently is.

Education needs to change its axis: it needs teachers willing to change the teaching model and to experience new methodologies that involve new technologies and new educational tendencies. As it was said in the introduction part, one of these tendencies is gamification. It has already been implemented in many schools, proving that a new approach in education based on our students' motivation is better to get a meaningful learning process and motivated and creative students.

Gamification builds a special environment within the classroom where the students are willing to learn due to what they are learning is focused on their interests and motivations. They see how the contents and activities taught follow gamified systems that are visible in other contexts they are familiar with, such as games, video games, online experiences...

ICT's and new technologies are implemented in the classroom and they are a fantastic link to gamification as well, due to ICT allow us to have online and technological resources providing the students a motivating offer of activities and dynamics.

This study aims to analyze this new tendency of education based on gamification and also offers an example of gamified system taken into a classroom context. This could help other teachers to have a reference in education at the time of changing their teaching models and adapt them to new tendencies based on the students' motivations.

Furthermore, this study is also based on the general competences of the Primary Education Degree and the specific competences related to the mention of Foreign Languages. Some of them are met in this project:

❖ **General Competences**

- Demonstrate to possess and understand knowledge in an area of study (the Education) that starts from the base of general education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that imply knowledge coming from the vanguard of the field of study.
- Application of the students' knowledge to their work or vocation in a professional way and possess the skills that are usually demonstrated through the elaboration and defence of arguments and the resolution of problems within their area of study.
- Ability to gather and interpret essential data to make judgments that include a reflection on essential issues of a social, scientific or ethical nature.

- Transmission of information, ideas, problems and solutions to a specialized and non-specialized public.
- Development of those learning skills necessary to undertake further studies with a high degree of autonomy.
- Development of an ethical commitment in the configuration as professionals, a commitment that should promote the idea of integral education, with critical and responsible attitudes; guaranteeing the effective equality of women and men, equal opportunities, universal accessibility for people with disabilities and the values of a culture of peace and democratic values.
- Knowledge, participation and reflection on the practical life of the classroom, learning to collaborate with the different sectors of the educational community, relating theory and practice. This competence will be specified in the development of skills to:
 - Acquire practical knowledge of the classroom and the management of it.
 - Be able to apply the processes of interaction and communication in the classroom, as well as master the skills and social skills necessary to foster a climate that facilitates learning and coexistence.
 - Control and monitor the educational process and, in particular, teaching and learning by mastering the necessary techniques and strategies.
 - Be able to relate theory and practice to the reality of the classroom and the centre. Participate in the teaching activity and learn to know how to do, acting and reflecting from the practice, with the perspective of innovating and improving the teaching work.
 - Participate in the proposals for improvement in the different areas of action that a centre can offer. Be able to regulate the processes of interaction and communication in groups of students aged 6-12.
 - Be able to collaborate with the different sectors of the educational community and the social environment.
 - Acquire habits and skills for autonomous and cooperative learning and promote it in students.

❖ **Specific Competences**

- Communicative competence in Foreign Language (English), advanced level C1, according to the European Reference Framework for Languages. This competence will suppose:

- Acquisition of linguistic (phonetic-phonological, grammatical and pragmatic) and socio-cultural knowledge of the foreign language.
 - Knowledge of the cognitive, linguistic and communicative bases on the acquisition of languages.
 - Use of techniques of corporal expression and dramatization as communicative resources in the corresponding foreign language.
- Plan what will be taught and evaluated in relation to the corresponding foreign language, as well as select, conceive and elaborate teaching strategies, types of activities and didactic resources. This competition will suppose:
- Knowledge of the main didactic models of teaching foreign languages to children and their application to the foreign language classroom at the different levels established in the curriculum.
 - Knowledge of the curriculum of Primary Education and the curricular development of the area of foreign languages.
 - Ability to develop attitudes and positive representations and openness to linguistic and cultural diversity in the classroom.
 - Promotion both the development of oral language and written production paying special attention to the use of new technologies as elements of long-distance communication in a foreign language.
 - Ability to stimulate the development of metalinguistic, metacognitive and cognitive skills for the acquisition of the new language, through relevant tasks and with a sense and closeness to the students.
 - Gradually development of the communicative competence, through the integrated practice of the four skills in the foreign language classroom.
 - Ability to plan the teaching learning process of a foreign language, selecting, conceiving and elaborating teaching strategies, types of activities and materials depending on the diversity of the students.

4. THEORETICAL FOUNDATION.

A. AUTHORS AND METHODOLOGIES.

4.1 Abraham Maslow: Hierarchy of Human Needs or Maslow Pyramid (1954).

Maslow's Pyramid is a psychological theory proposed by Abraham Maslow in his work: A Theory on Human Motivation of 1954. Maslow formulates a hierarchy of human needs that as basic needs are met (the ones at the bottom of the pyramid), human beings develop higher needs and desires (at the top parts of the pyramid). (Maslow, 1954).

The scale of Maslow's needs is often described as a pyramid consisting of five levels. The first four levels can be grouped together as primordial. At the higher level it is found what he called 'self-realization', 'growth motivation' or 'need to be'. The difference is that while the needs of deficits can be met, the 'need to be' is a continuous driving force.

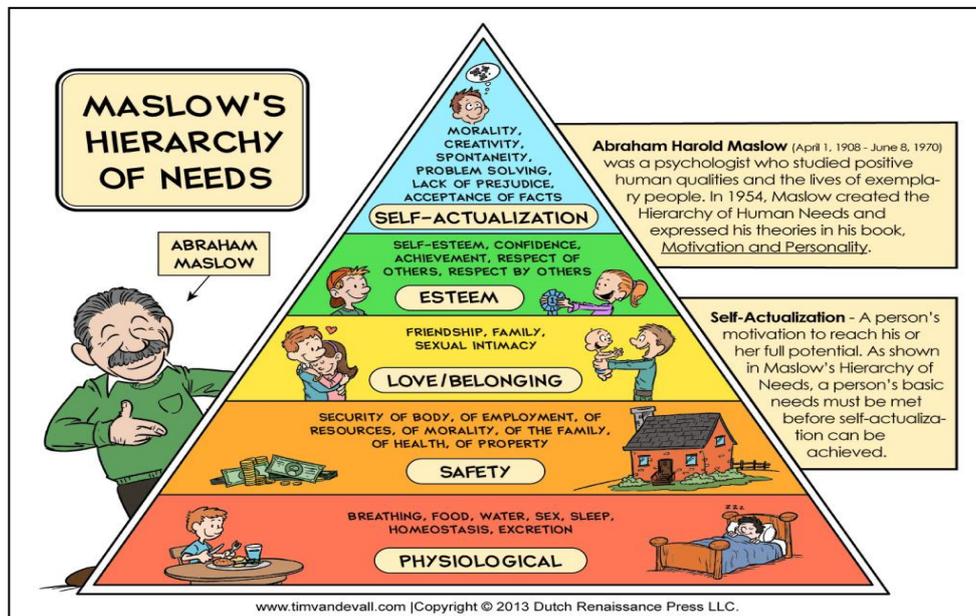


Figure 1: Maslow's Pyramid

The basic idea of this hierarchy is that the highest needs occupy our attention only when the lower needs of the pyramid have been met. The forces of growth give rise to an upward movement in the hierarchy, while the regressive forces push the dominating needs down into the hierarchy. According to the Maslow pyramid we would have:

- ❖ **Basic needs:** There are basic physiological needs to maintain a stable internal condition, among which the most obvious are:
 - The need to breathe, drink water and feed.
 - Need to maintain the balance of pH (potential of hydrogen) and body temperature.
 - The need to rest, sleep and eliminate waste.
 - Need to avoid pain and have sexual intercourse.
- ❖ **Security and protection needs:** These needs arise when the physiological ones remain compensated. These are the needs to feel safe and protected, even developing certain limits in terms of order. Within them we find:
 - Physical and health security.
 - Security of employment, income and resources.
 - Moral, family and private property security.
- ❖ **Affiliation and affection needs:** They are related to the affective development of the individual, so that they are the needs of:
 - Association
 - Participation
 - Acceptance

These needs are fulfilled by the functions of services and benefits including sports, cultural and leisure activities. Human beings feel the need to relate, to be part of a community, to be grouped in families, with friends or in social events. Among these needs we can find friendship, companionship, affection and love.

- ❖ **Estimation needs:** Maslow described two types of esteem needs, one high and one low.
 - High esteem concerns the need for self-respect and includes feelings such as confidence, competence, mastery, achievement, independence and freedom.
 - Low esteem concerns respect for other people: the need for attention, appreciation, recognition, reputation, status, dignity, fame, glory, and even dominance.

The decline in these needs is reflected in low self-esteem and the inferiority complex. Satisfying this need supports the sense of life and appreciation as an individual and

professional, who can calmly step up and move towards the need for self-realization. The need for self-esteem is the need for balance in the human being, given that it is the fundamental pillar for the individual to become the successful person they have always dreamt of, or in the person destined to failure, who will never achieve anything by their own means.

❖ **Self-realization or self-actualization:** This last level is somewhat different and Maslow used several terms to name it: 'growth motivation', 'need to be' and 'self-realization'.

It is the highest psychological need of the human being and it appears at the top of the hierarchy. It is reached when all the previous levels have been reached and completed, or at least to a certain extent.

Maslow's pyramid represents an important contribution in a change of vision within psychology as well as with the psychoanalysis and the behaviourism. His approach to psychology and life in general inspires enthusiasm. Maslow's works were a first attempt to study something of great importance: the common good, the elements that are priorities for all people.

4.2 Frederick Herzberg: Double Factor Theory of Motivation (1959).

Frederick Herzberg was an American psychologist who became one of the most reputable professionals in the field of business management and administration. Due to his Double Factor Theory and the implementation of job enrichment, he gained a great recognition within the field of work psychology and organizations, a concept in which initiatives that lead to a more efficient management of the work are always welcome. This theory is nowadays applied to education in terms of classroom management.

This theory hypothesized about the factors that produce satisfaction or dissatisfaction in the students and how it covers their work needs. The basis of the theory is that the elements that cause job satisfaction or dissatisfaction are of completely different natures. Also, the theory is based on the idea that the person has two types of needs:

- The need to avoid pain or events that cause discomfort.
- The need or desire to progress and mature both emotionally as an intellectual.

When this system of needs is applied to education different incentives are needed, hence the duality. This duality consists of two types of factors that operate in the labour motivation; both explain a good part of the work dynamics that take place within the classroom:

- ❖ **Hygiene factors:** These are those factors extrinsic to the students and are mainly associated with job dissatisfaction. They are located in the environment that surrounds the students and include the conditions that determine the work carried out by them. It is said that these factors are extrinsic because they depend on the decisions of the teachers and the way they have to manage them.
- ❖ **Motivation factors:** Unlike hygiene factors, the motivation factors are intrinsic to students, since they are directly associated with satisfaction with the position as well as with the nature or type of tasks that the students perform within the classroom. These motivational factors would be under the domain of the individual, and they include the feelings or perception that the student has about their growth and development within the classroom, as well as recognition, the desire for self-fulfilment and the need for responsibilities. These intrinsic motivational factors are:
 - Faculty stimulating work
 - Feelings of self-realization
 - Achievements
 - Recognition by the teachers
 - Possibility of increased responsibilities

After identifying all these factors Herzberg deduced a series of conclusions that completed his theory:

- A bad environment causes immediate dissatisfaction among students, but a healthy classroom environment does not guarantee their satisfaction.
- Avoiding job dissatisfaction is just as important as promoting job satisfaction.
- Hygiene factors and motivation factors are activated and deactivated independently, being able to give characteristics of both factors in the same person.
- Hygiene factors all have the same relevance.
- The improvement and development of hygiene factors have positive effects in the short term.

- Hygiene factors are temporary and cyclical: the workers renew these needs as time passes.

4.3 Edwin A. Locke: Goal-Setting Theory (1969).

Edwin A. Locke is an American psychologist pioneer in the theory of goal setting which operates on the premise that individuals create their goals by making careful decisions to do so and they are committed to meeting those goals by virtue of the goal they have set.

Basically, Goal-Setting theory states that if individuals set goals, they will be motivated to achieve those goals by the simple fact of having established them. There must be several elements for this to take effect so the goals must be clear, challenging and achievable. There must be a method by which answers are received. The goal itself is not the motivation, but the difference perceived between what was achieved and what was planned (Locke, 1969).

At the end of the 1960's, Edwin A. Locke proposed that the intention to achieve a goal is a basic source of motivation at work, hence goals tell an employee what needs to be done and how much effort will be necessary to develop. Locke states that self-efficacy is the belief that the individuals have that they are capable of developing a task. The greater the self-efficacy is, the more confidence there is in the ability to succeed in a particular task.

Goals can have several functions:

- Focus attention and action by being more attentive to the task.
- Mobilize energy and effort.
- Increase persistence.
- It helps in the development of strategies.

For goal setting to really be useful, goals must be specific, difficult and challenging, but possible to achieve. Locke states that there are five principles that must be followed to establish goals:

❖ Clarity

The objective proposed must be specific. The very general objectives will lead the students to lose their true purpose and they will end up with little motivation to continue. In the same

way, it is necessary to establish what is wanted to achieve from the very beginning in order not to deviate, as this could be a waste of time and effort.

❖ **Set challenges**

As a general rule, the more difficult a goal is, the more satisfaction there will be after completing it. Adding challenges will become a decisive factor in long-term projects in which individuals will have to perceive the benefits to keep themselves interested. On the other hand, they must be realistic and abandon those very complex objectives that they know they cannot fulfil, because instead of benefits, they will perceive losses.

❖ **The commitment**

This step is the most obvious: if a person chooses an individual goal, they will automatically commit to it, unless they have been forced to participate in it; then it will be difficult to feel motivated to be responsible and constant. Often, schools and teachers will present activities that students will not like, which will generate complaints that will eventually lead to poor performance. To avoid this scenario, it is important that individuals do not force their team work. It is essential to maintain a friendly tone, listen to other opinions and talk about the activities until getting to a mutual agreement.

❖ **Feedback**

One of the most important elements to take into account in the delegation of tasks is the feedback. Make people feel recognized for their efforts: if they manage to fulfil a feeling of appreciation, they will be rewarded with positive results. On the other hand, it is important to be honest and provide guidance when the performance decreases which will help them to improve.

❖ **The complexity of the tasks**

Sometimes, tasks can become very complex and paralyze people. To avoid this, it is preferable not to think about its objective as a whole, dividing by categories what it is proposed, as if there were individual goals. This will help them to organize and not lose their temper. It is also important to keep in mind that people may need additional help or training to meet certain goals. It is essential to provide them support to avoid bad feelings. At the same time, it will promote an adequate an organizational culture of working.

4.4 Edward L. Deci: Self-Determination Theory (1970).

The theory of self-determination is based on human motivation and personality put in relation to the inherent tendencies of personal growth. It has to do with the motivation of humans when making decisions that they make without any external influence and becomes a key element when trying to motivate them through gamification.

In the 1970's, Edward L. Deci, professor of Psychology at the University of Rochester in New York, carried out a series of experiments concluding that although it is possible that rewards can increase motivation somewhat when it comes to do repetitive and boring tasks, when it comes to develop tasks that require creative thinking, the rewards not only do not help but can even harm.

Surprisingly, in many of these experiments, groups of people who did not receive an external award obtained better results than those ones who were awarded. When internal motivation is replaced by a reward, creativity is diminished. In addition, in these situations rewards can encourage people to look for shortcuts, cheats and unethical behaviours.

Along with Richard M. Ryan, Deci elaborated the Self-Determination Theory, also known by its acronym SDT. It is based on the fact that all human beings have three innate psychological needs and when those needs are satisfied, humans are motivated, productive and happy. These three innate needs are the following ones:

- ❖ **Autonomy:** Humans need to feel that they have the capacity to make their own decisions. Thus, the increase of the options and choices allows them to increase their intrinsic motivation.
- ❖ **Relationships:** Human beings are social by nature. They need to connect with other human beings and feel that they occupy a place within society. This social need is what makes an imperative the possibility that personal achievements can be shared in society. When a person overcomes a challenge, there must be the possibility that this challenge can be shared with others who have the same interests.
- ❖ **Need to be competent:** Humans need to feel that they have the possibility to practice and improve their skills. Positive feedback on a task increases the intrinsic motivation of the individuals.

According to this, motivating others to give their best, rather than trying to motivate them directly, is what we must do to create the right environment so that those natural needs can be satisfied.

4.5 Mihaly Csikszentmihalyi: Theory of Flow (1975).

The main purpose of gamification is to achieve certain user behaviour. To achieve this goal, using the mechanics of the game in other areas is only the means. When it comes to making sure that the gamification strategy used is successful among the user, it is important to keep in mind the Theory of Flow carried out by the American psychologist Mihaly Csikszentmihalyi in 1975.

Mihaly's research is documented in the book *Flow: The psychology of optimal Experience* where explains that happiness is born from a productive action.

Mihaly interviewed mountain climbers, monks, shepherds and a huge variety of people with different levels of education and culture, finding out common elements that indicate when entering the state of flow:

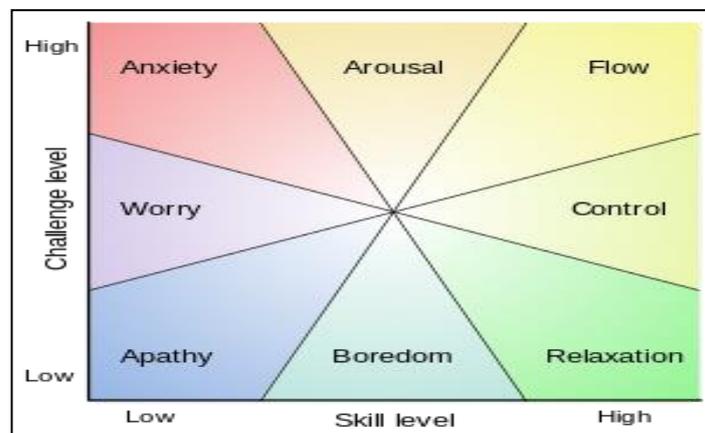


Figure 2: Common elements of Flow's Theory

In his studies, Mihaly was able to measure what people feel in every 10 minutes thanks to the research tools. The results have been reflected in this well-known graphic: In yellow *'our magic zone'*.

In the interviews, Mihaly asked if it was recognition, fame, money or even material acquisitions what made a person happy, but the final conclusion is that all the successful interviewees felt happy during the execution of the activities chosen by them. They described

sensations like merging, feeling of ecstasy and losing the notion of time. That was what Mihaly named by *Flow state*.

The 'Flow state' is essentially the ability to concentrate our psychic energy and attention on a consciously chosen goal, based on our internal coherence. Then, the psychic energy literally flows in the direction of that goal, so people can have that feeling that they are on the right track. (Csikszentmihalyi, 1975).

Mihaly in his studies mentions a lot of artists, painters, writers, musicians, dancers and also athletes for his high capacity to generate flow, but it is a situation perfectly comparably to any situation. During these moments of optimal experience, people feel strong, alert, in a state of control without effort, losing consciousness of themselves and at the peak of their abilities.

Following the footsteps of Maslow, whose theory was described previously, Csikszentmihalyi insists that happiness is not limited to happen, it must be cultivated by each person through the establishment of challenges that are neither too demanding nor too simple for skills that we have.

If people perform a task far below their abilities, the result will be boredom, discontent and frustration. If people perform a task well above our abilities and capabilities, they will feel overwhelmed and stressed.

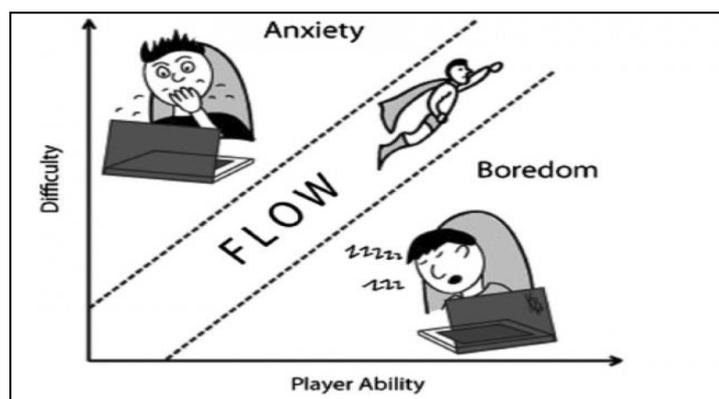


Figure 3: Flow's Theory diagram

While Csikszentmihalyi's research focuses on the area of creative work and production, it can also be observed that the state of flow is applicable to various types of relationships and situations; such as challenges set in the classroom, friendship or sentimental relationships. Even in times of adversity we can turn this setback into a challenge. There are people who

have developed their flow in such a way that they are able to translate any potential threat into a pleasant challenge, and therefore maintain an inner tranquillity. Someone who does not get bored, often and rarely feels anxious, because it melts with the flow most of the time.

4.6 Lev Vygotsky: Zone of Proximal Development Theory (1931).

Within Vygotsky's theory of language development, there is a concept that stands out called ZPD and stands for *Zone of Proximal Development*. It is defined by the author as the distance in the real level of development determined by the ability to independently solve a problem and the level of potential development as determined through problem solving under adult guidance or in collaboration with a more capable companion.

In other words, it is the space in which children, through interaction and support of others, can work and solve a problem or carry out a task in a way and at a level that would not be able to have individually. In each student and for learning contents exists an area that is next to be developed and one that at the moment is out of reach.

The ZPD has two limits:

- Lower limit: level of skill reached by the child working independently.
- Upper limit: level of additional responsibility that the child can accept with help of an able person.

4.7 Jerome Bruner: Scaffolding (1976).

Referring to the previous explained Vygotsky's theory, it is interesting to make use of the term of '*scaffolding*' which appears since teachers create learning situations that facilitate the internalization of contents to learn by taking into account the ZPD of the children.

The concept of '*scaffolding*' refers to a form of guided discovery through which the teacher is spontaneously and naturally leading the process of knowledge construction. Bruner's consideration about knowledge is that it is susceptible to being refined, perfected and that is why it seeks to promote active learning, encourages companionship and teamwork.

Bruner formulates the concept of scaffolding in 1976, based on the concept of ZPD from Vygotsky's Theory. The fundamental assumption of the scaffolding is that adult tutorial interventions must have an inverse relationship with the level of competence in the child's

task: less level, more help. What the teacher offers is only help, because the real architect of the learning process is the student. In the metaphor of the scaffolding it is evident:

- The necessary nature of help.
- The transitory nature of help.

The effective teacher must have a good education regarding the knowledge of the student and the educational methodology and be critical and reflective because it will be the context and the groups of students which will indicate what kind of help is needed to provide. Scaffolding presents a set of features:

- Adaptable: It must be adapted to the level of competence of less experienced subject and progress to occur.
- Temporary: It cannot turn into a routine because it would hamper the expected learner autonomy.
- The students must be aware of being helped, which will facilitate progress towards autonomy.

The purpose of this theory is to guide children through the learning process, lending them support until it becomes clear that they have to achieve independence in their tasks. Bruner believed that scaffolding could help children to become self-regulated and independent students.

4.8 Howard Gardner: Multiple Intelligences (1983).

Professor Gardner developed the latest theories in psychology on Multiple Intelligences, leaving behind the almost unique conception of intelligence. Up to that moment, rational intelligence was the unique measure: children were only evaluated and enhanced logical-mathematical and linguistic intelligence through tests similar to the one proposed by Stanford-Binet. In contrast to this view, cognitive competence is understood as a set of skills, talents and mental abilities by the theory of Multiple Intelligences. All people possess these skills, mental abilities and talents at different levels of development.

Gardner considers intelligence as a combined potential that can develop and grow along the life of the individual. Gardner (1983) defined it as “the ability to solve problems or make products that are valued in one or more cultures”, and use terms such as ‘ability’ and ‘aptitude’ instead of using the word ‘intelligence’ as other people have traditionally used.

Gardner adds that just as there are many types of problems to solve, there are also several types of intelligence. The psychologist and his team at Harvard University have identified eight different types:

- ❖ **Linguistic:** Ability to understand and use the language itself. Writers, poets and good editors frequently use this Intelligence. It requires the activity of both hemispheres.
- ❖ **Logical-Mathematical:** Ability to understand abstract concepts. It is used to solve problems of logic and mathematics. This kind of intelligence corresponds to the way of thinking of the logical hemisphere and what our culture has traditionally been considered the unique intelligence. Scientists or engineers are examples of people who use it.
- ❖ **Visual-Spatial:** Ability to perceive the placement of the objects in space and bearings. Our mind creates a mental model of the world in three dimensions. This intelligence belongs to sailors, engineers, surgeons, sculptors, architects and decorators.
- ❖ **Bodily-Kinaesthetic:** Ability to perceive and reproduce movement, using the body in order to carry out activities or solve problems. It allows developing sports skills and dancing. It is the intelligence of athletes, craftspeople, surgeons and dancers.
- ❖ **Musical:** Ability to perceive, listen and reproduce music. It allows singers, composers, musicians, and dancers develop this kind of skills.
- ❖ **Intrapersonal:** Ability to understand and self-control oneself. It is based on self-esteem, self-confidence and emotional control. It is not associated with any specific activity, but it is often found in good salespeople, politicians, teachers or therapists.
- ❖ **Interpersonal:** Ability to put yourself in the place of others and learn to deal with social situations. It helps us to improve relations with others: social skills and empathy. It enables us to understand others, and it is usually found in good salespeople, politicians, teachers or therapists. Intrapersonal and interpersonal intelligence make up emotional intelligence together and determine our ability to conduct our own lives successfully.
- ❖ **Naturalist:** Ability to get on well with nature. It is used when the nature is being observed and studied with the purpose of knowing how to organize, classify and order it. This kind of intelligence belongs to biologists, naturalists and environmentalists.

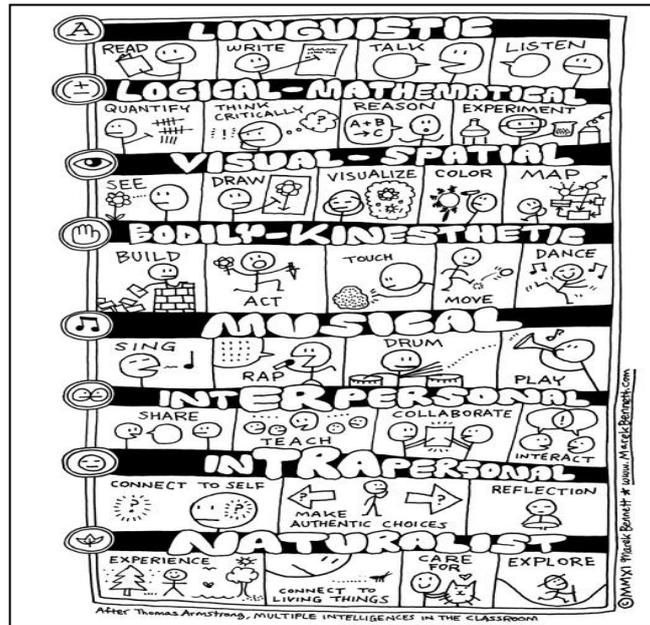


Figure 4: Gardner Multiple Intelligences

4.9 Tracy Terrell & Stephen Krashen: Natural Approach Theory (1983)

Krashen and Terrell view the Natural Approach as belonging to a centuries-old tradition of learning "based on the use of language in communicative situations usually without recourse to the native language" (1983, p. 10). As such, the method is partially a rediscovery of older methods such as the Direct Method of the early 20th century.

The difference between the Natural Approach and previous methods, according to Krashen and Terrell, is that the Natural Approach is "based on an empirically grounded theory of second language acquisition, which has been supported by a large number of scientific studies" (p. 1).

The Natural Approach has received considerable attention in professional literature and has been influential in the development of textbooks and teaching materials.

4.9.1 Theory of Language Learning.

The Natural Approach is a theory based on naturalistic principles of language acquisition. Krashen has enunciated these principles in his "Monitor Model," which consists of five hypotheses about language learning:

1. **The Acquisition-Learning Hypothesis:** adults have two distinct ways of developing competence in a second language:
 - Acquisition: whereby language is learned by simply using it for communication, much as children learn their native language.
 - Learning or conscious study of the language: learning cannot lead to acquisition, implying that language proficiency is a result of natural acquisition rather than conscious study of grammar and vocabulary.

2. **The Natural Order Hypothesis:** This hypothesis maintains that grammatical structures, particularly morphemes, are acquired and not learned in a predictable order.

3. **The Monitor Hypothesis:** It states that utterances in the second language are initiated by the acquired system, not by rules that are consciously studied. The only function of conscious learning is for speakers to monitor the accuracy of their performance, when they are focusing on correctness, and they know the rules involved and have time to think about them.

4. **The Input Hypothesis:** This hypothesis claims that individuals acquire languages by understanding input that is slightly beyond their current level of competence. This input is generally in the form of listening or reading. Krashen represents this hypothesis with the formula $I + 1$, where I represents the person's current level of language competence.

5. **The Affective Filter Hypothesis:** This hypothesis affirms that learners' attitudes and emotions can facilitate or impede language acquisition. When students experience anxiety, their "affective filter" prevents them from receiving input that could further their acquisition of the language.

In accordance with these hypotheses, Krashen and Terrell (1983) describe four principles on which the Natural Approach is based:

- Comprehension precedes production: listening and reading precede speaking and writing. This implies that the instructor always uses the target language and strives to make their speech comprehensible through gestures, examples, pictures...
- Production is allowed to emerge in stages: with students first responding nonverbally (the "silent stage"), and later with single words, combinations of words, and then

sentences and paragraphs. Responses in the students' native language are also accepted in the early stages.

- The course syllabus consists of communicative goals and is organized by situations, functions, and topics rather than grammatical structures.
- Classroom activities should foster a low affective filter by making input comprehensible to students, encouraging them to express their thoughts and feelings, and not correcting their errors.

Krashen and Terrell (1983) provide a list of suggested topics and situations for beginning classes, which include identifying and describing oneself; recreation and leisure activities; family, friends, and daily activities; plans, obligations, and careers; eating; travel and transportation; and shopping and buying. Classroom activities are centred around these topics.

One technique that Krashen and Terrell recommend for classes at the beginning level is Total Physical Response, using students' physical characteristics and clothing to teach vocabulary. At this stage, students may respond nonverbally or with one-word answers.

Grammar-based activities have a place in the Natural Approach, but they "do not assume the dominant role which they have in other approaches" (Krashen & Terrell, 1983, p. 142). Any study of grammar is primarily done by students outside class so that classroom time may be reserved for communicative activities. If grammar is explained in class, the explanation is kept short and done in the target language, with the understanding that the language of the explanation itself can serve as input for acquisition.

4.10 Daniel Goleman: Emotional Intelligence (1995).

Referring to the previous Multiple Intelligences, it is needed to make reference to the importance of another kind of intelligence, essential in children's personal and academic development: It is the emotional intelligence. Gardner laid the foundation of this theory, which later was developed by Daniel Goleman.

Emotional intelligence has a background in the historical development of research on intelligence, from its origins in the early 20th Century to Multiple Intelligences eighty years later.

It is an important aspect of the psychology of emotions, considering that educational intervention is the basis of emotional competencies and it is the main reference of emotional education. For Goleman (1995) emotional intelligence consists of:

- Knowing personal emotions: It allows us to be aware of our own emotions, recognizing feelings in the moment they happen. An inability in this sense leaves us at the mercy of uncontrolled emotions.
- Managing Emotions: The ability to manage feelings to express ourselves appropriately is based on awareness of the emotions themselves. Moderating expressions of anger, rage or irritability is vital in interpersonal relationships.
- Motivate ourselves: An emotion tends to push towards action. That is why emotion and motivation are closely interrelated. Directing emotions and consequent motivation towards the achievement of goals is essential to pay attention, motivate ourselves and develop creative activities. People who possess these skills tend to be more productive and effective in the activities they undertake.
- Recognize others' emotions: Empathy allows us to recognize others' emotions. It is fundamental because is based on knowledge of personal emotions and the base of altruism. Empathic people tune better with signals that indicate what others need or want.
- Establish relationships: The art of establishing good relationships with others is largely the ability to manage emotions of others. Social competence and skills involved are the foundation of leadership, interpersonal popularity and efficiency. People who master these skills are able to interact gently and effectively with others.

4.11 B. J. Fogg: Behaviour Model (2007).

Gamification is defined as the use of game dynamics and mechanics in the non-play field in order to influence the behaviour of the players (Fogg, 2007). There are different models of human behaviour, but Fogg's Behaviours Model is one of the most popular in recent years.

This model tries to go in depth into the causes that can trigger a change in behaviour in the player, depending on what should be given to three basic elements with which a user can modify their behaviour:

- **Trigger:** there must be an action that triggers the behaviour. For instance, a call that encourages the user to participate in the proposed activity.
- **Skill:** the user must be able to execute the proposed activity.
- **Motivation:** the willingness of the user to participate in the activity proposed by himself.

Motivation is usually attributed to the motivation of getting a user involved in the activity. Fogg breaks the trend by which it is believed that the main element to modify the behaviour of a user is motivation. According to Fogg simplicity is more important when changing behaviour. An element that encourages a user to take action will lead to greater motivation to participate in the long term in the activity proposed.

Fogg also considers it essential to help the user in the task entrusted. Although it is tried to force that the motivation in the user, if this one does not want to develop the proposed activity it will not do it. That is why it is important to use triggers or triggering actions before promoting only the user's motivation. The Fogg model emphasizes the need for motivation, capacity and 'trigger' to be in balance so that user behaviour occurs according to the initial plan.

B. DEFINITIONS AND IMPORTANT ASPECTS OF GAMIFICATION.

4.12 What 'Gamification' is and what it is not.

In order to start developing the topic of this project, it is needed to understand what gamification is first. As Rodríguez and Santiago (2015) stand out in their book *'Gamification. How to motivate the students and improve classroom environment'*, the term 'Gamification' comes from the English word 'Game' and it was coined by Nick Pelling in 2002, but it was not until 2010 when it became more popular.

It could be defined as the process by which mechanics and game design techniques are applied to seduce and motivate people in the achievement of certain objectives. Gamification brings the different mechanics and techniques found in games into contexts that have nothing to do with them, in order to try to solve real problems.

If it is taken to the educational framework, a really easy way to understand what gamification is, is to describe it as the action of the students trying to do what they do not always want to, using the game for it.

Gamification is, therefore, an excellent tool teachers can use to introduce themselves in the world of their students. It is a good opportunity to get out of traditional methodologies which may not be adapted to the needs their students have nowadays, allowing teachers to get close to their students being aware of their interests, motivations, problems, difficulties and also their achievements reached thanks to this methodology.

Using games make teachers aware of the mechanisms of motivation: proceeding like the students were playing the game in all the tasks of their life will reinforce their abilities and skills to solve problems and situations, not only at school, but also in their daily lives.

The game teaches them the principles of motivation. Gamification increases our students' moral strengths with every small victory and new learnings. It also makes tasks become easier, so that our students will want to take risks and go for new difficulties. It erodes the resistance that tasks usually oppose, as they stop intimidating us and producing laziness by becoming more fun or enjoyable.

However, the term of gamification begins to be used excessively on many occasions. It is fashionable: it seems that everything that has something to do with games necessary has got something to do with gamification, but there are many reasons why they are not the same:

- ❖ Gamification is not about creating a game: Obviously, games and gamification have something to do, but when talking about the field of education, there is a clear difference. If the first thing teachers think about when creating a gamification project is to make a game, they are already starting on the wrong track.
- ❖ Gamification is not a Serious Game: It is better that teachers interpret gamification as a tool used to change behaviours, measure results or motivate. Of course, there is a learning experience behind it: it is not the same to teach our students to solve a problem (which could make reference to a serious game), than to teach them to acquire the habit of solving problems on a daily basis (related to a gamification process). A serious game is called 'serious' due to its main objective is to achieve a concrete learning goal, to solve a problem or a real-life situation, which is not the same as getting a more fun and motivating task.

- ❖ Gamification is not Game Theory: Sometimes gamification is confused by the application of Game Theory. Game Theory tries to study the strategy behind the decision making. It has to do with the different players in a competitive scenario where they make optimal decisions, and it is mainly applied in politics, geopolitics and economics.
- ❖ Gamification is not to create a reward system: It is clear that there must be reward models, but in no case should they be the purpose of the project. The fact of playing must be the greatest of the rewards.
- ❖ Gamification is not PBL (Points, Badges and Leader Boards or ranking): The easiest thing to do within our classroom is to incorporate these elements found in most of the games known. That would allow us to say we have got a gamified system, but the real thing is that we do not. Of course, these elements are part of the gamification methodology but they are not the centre of it.

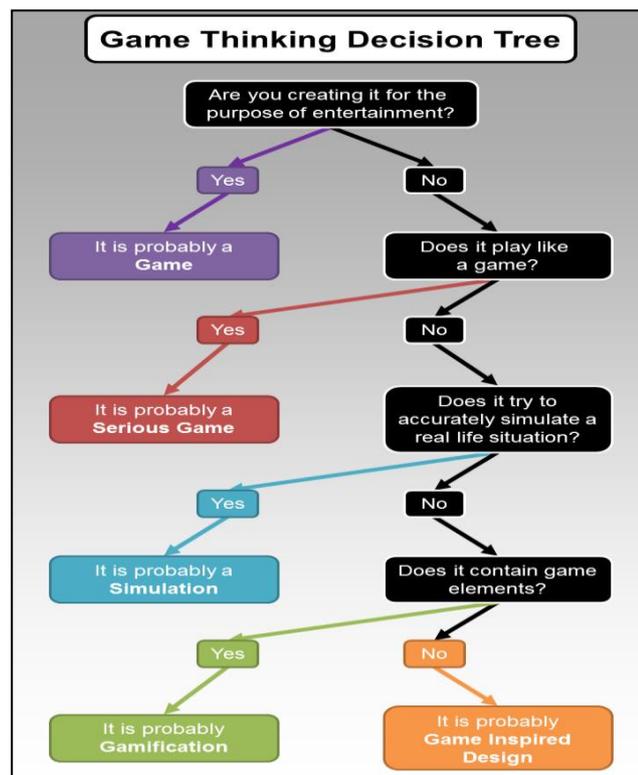


Figure 5: Game Thinking Decision Tree by Rodríguez, F.; Santiago, R. (2015)

4.13 Gamification and New Technologies.

There is a very common tendency to think of gamification as a term that must be related to technology. It seems to be new and modern, which it is in a way, but it is also a term that has been accompanying education for many years, since María Montessori and Joan Piaget started to develop their methodologies of 'learning by doing'.

The problem is that the society thinks that technology is everything that has something to do with what is new, different and has got scientific elements. This description is true in a way, but it is needed to say that technology is, in fact, everything described before, but also what makes our lives easier and what improves our coexistence with the environment and other people.

Nowadays, there are many students in our schools; all of them belong to the new era of technology. It is not strange to find a Primary Education student playing with a technological device such as a tablet or a smartphone. However, those technologies are not found in their classrooms in many of the cases. Here comes the problem: there are only a few motivated students within the classroom, in the best of the cases, but the rest present a lack of attention to what they are learning. This scenario is presented every day for teachers, even though they have got resources in the classroom which can implement technologies in the learning process of their students, but sometimes, that is not enough.

Taking into account these premises, it is clear that teachers have to use technology as an element of motivation for their students, trying to implement it within their classrooms by developing a gamified system. Of course, it is better to continue using the same traditional teaching methodologies due to the fact that the change to gamification requires time, effort, practice and also motivation for teachers, but it has been proved in many real teaching practice cases that it is worth it.

According to John W. Moravez (2011), the application of technology to learning is based on four essential premises, which can be transferred to gamification and help us to decide which technology to use. These four premises are the following ones:

- ❖ Technology has to have a well-defined purpose: It is not about applying different technologies because we can, but because we must. The question that we have to ask ourselves whenever we want to incorporate technological systems in a gamified

system is if we want to incorporate them because they contribute to our students' experience or because we want to show that we have been able to incorporate them.

- ❖ Technology is intended to contribute to the development of our mindware: Technology should be used as the instrument to enhance our imagination, our creativity and our capacity to innovate. In a gamification project, teachers must use systems that help the students to think laterally, to go beyond what they already know, to establish unsuspected relationships and to think 'out of the box'. As in a video game of exploration, teachers should help students to think of alternative routes to reach unsuspected results.
- ❖ Technology must work out as a social tool: When the social component is incorporated into a gamification project is when positive rivalry, competition, desire to excel, collaboration and teamwork arise from our students. Rankings, leader boards, group recognition mediators such as badges or medals, are mechanics that impel the organization between the students in favour of a common goal, something that surpasses the personal benefit. This is when the different attributes of each student are combined to achieve a superior and transcendent goal.
- ❖ Technology evolves constantly: What today is trending topic tomorrow will seem obsolete. The simpler and lighter the combination of technologies that teachers apply in their projects, the easier it will be to resist the obsolescence to which society is accustomed.

Therefore, gamification takes advantage of the potential of technology to develop the social and exploratory skills of our students as well as their creativity and lateral thinking, without losing sight of the 'why' of its application and making its incorporation to the project as transparent and natural as possible.

4.14 Important aspects within gamification.

As it is explained in previous parts of this work talking about gamification means thinking about behaviours that want to be changed in order to achieve what we have set as a goal for our students. This process can lean on a very complex system of technology or it can be something really simple. There are many factors that cause a change in behaviour, as Dr. B.J. Fogg (2007) explains in his book about behaviour model. If one of them is not presented in the process of gamifying our classroom, new behaviours will not take place.

There are many variables within the process of gamifying a classroom, but also there are many more when treating gamification as a Digital Learning System. This system takes into account several elements taken into a learning environment. The main objective is to, on the one hand, value as teachers whether a system is interesting or it is not, in terms of using it in the classroom; but on the other hand, is to try and practise simple and useful techniques as a trigger of changing behaviours within the classroom. In short, the main question teachers have to ask themselves at the time of applying a gamified system in the classroom is the following one: *'what do I get incorporating this tool in my classroom?'*

4.14.1 Gamification online tools.

There are some digital tools that teachers might find interesting to use in their classroom and which are focused on different aspects that are worked and try to be improved within the classroom. Here there are some examples:

- **ClassDojo** is used to model behaviours within the classroom in a very attractive way to our students, which help teachers to motivate them. It contains many resources including music, games, avatars and lists.
- Making the contents more attractive through video lessons is a function that **Khan Academy** develops on its digital media.
- Focusing in problem solving strategies using computers and cooperative learning is worked by **Toovari** or **Kahoot!**
- **ClassCraft** is a digital universe where teachers can create their own classrooms based on magical worlds where the students are different animated characters within a role game. They have got different powers and positions, depending on the type of players the students are, and also the game counts on a points and rewards system that gives the students a huge amount of motivation for their tasks. It is a platform that can be included within any kind of curriculum and helps teachers to carry out the general planning in a different and playful way.

4.14.2 Design of a gamified system.

Another important aspect within gamification is the design of the digital media or gamified system teachers are using. If they are using a digital platform which is already done, they will assure it is attractive for their students. However, everything changes when the teachers are the ones in charge of creating their own interface. It must be adapted to the kind of students

they are working with, as well as make sure the elements presented in the game are on the contents of the interface. Students must have a good experience as users so that their motivation goes along their learning process.

4.14.3 Connection with the students' lives.

The connection of the gamified system with the real world our students are living in is a very important aspect within gamification. Our students will learn more if the project we are working with is connected with their realities and experiences. The environment of the gamification project of our classroom must be opened, social, collaborative and participative. Students and teachers are social human beings, so they need to interact among them in both of the cases: in real life and in the digital game-system.

The students will be more motivated if the gamified system they are working with gives them real experiences or consequences in real life. It is really important that teachers know how to connect both realities in the classroom. Playing the gamified system in a digital and real way within the classroom and give the students the opportunity to find out that it has an impact outside of the school is what makes the learning process meaningful and what achieves our students' motivation.

5 DESIGN.

5.1 “Escape the Earth”: A unit based on gamification.

“Escape the Earth” is a unit which was implemented in Primary Education within the subjects of English and Natural Science. It was taught in order to try to carry out something new, due to the school was implementing many programmes and plans that included educational innovation.

It was suggested to develop the unit based on gamification from the beginning, which will make possible for teachers to see the difference between the normal development of the students and the one with the gamified unit. The process and the results are what the design of this project is about.

5.1.1 The school.

The school in which the unit was implemented is located in centre of Palencia. It is a catholic and private school with a big number of students of all ages, from 3 to 18 years old. It has got two lines, so there are two classrooms per level.

This school has got a bilingual section, so along Infant, Primary and Secondary Education stages there can be found many subjects which are taught in English. Focusing on Primary Education and depending on the stage, the different subjects taught in English are the following ones: Arts and Crafts, Natural and Social Science, Physical Education and English Language. These subjects are developed during several hours within the timetable. Depending on the stage, the average of hours per subject done through English is between 2 and 3 hours each per week.

As well as the bilingual Section, this school has implemented several programmes and plans in order to work with cooperative learning and the use of ICT and New technologies.

5.1.2 The groups.

This unit was developed in Year 6, so it was carried out by two different groups due to the two lines of the school. Each group had a total of 27 (A) and 26 (B) students. Both groups were similar in terms of knowledge but they were quite different when developing tasks and carrying out team work and diverse activities.

The students were all between 12 and 13 years old, which gave them more maturity at the time of facing several situations during the entire process of the unit. However, as they were still shaping their personality, teachers could see different characters and behaviours within the classroom which are common at this stage.

5.2 Features of the unit.

Year 6 is a stage where several aspects are different from other stages: It follows a programme where here are no textbooks and the students use tablets instead. These aspects determined some features of the unit, making it more technological and based on ICT.

As it was described before, this unit belongs to the subject of English, but it's got a part based on Natural Science due to it is based on natural disasters. The activities were programmed in order to work with the five skills: speaking, reading, listening, writing and use of English. That is why there were a varied sort of dynamics.

In the following chart, there can be found the main features of the unit:

GRADE 6	Term: 3 rd	Dates: 24 th April - 18 th of May
	ENGLISH	NATURAL SCIENCE
STANDARDS	<p>SOCIOCULTURAL AND SOCIOLINGUISTIC ASPECTS</p> <ul style="list-style-type: none"> - Customs, habits, routines with schedule and celebrations. - Life conditions. - Values, beliefs and attitudes. - Interest and respect for cultural differences in English-speaking countries. 	<p>BLOQUE 4: “LOOK AFTER OUR ENERGY RESOURCES”</p> <p>4.1. Identify and explain some of the main characteristics of renewable and non-renewable energies, identifying the different sources of energy and raw materials and the origin from which they come.</p> <p>4.2. Identify and explain the benefits and risks (depletion, acid rain, radioactivity, greenhouse effect) related to the use of energy, exposing possible actions for sustainable development.</p> <p>4.3. Explains the importance of exploitation and use of resources in a sustainable manner and links it to economic activity.</p>
COMMUNICATION FUNCTIONS	<ul style="list-style-type: none"> - Description of people, activities, places, objects, habits, plans. - Request and offer of help, information, instructions, objects, permission. - Expression of ability, taste, preference, opinion, agreement or disagreement and feeling. - Narration of past, future and recent events. 	
SYNTACTIC-DISCURSIVE STRUCTURES	<ul style="list-style-type: none"> - Expression of the modality: factuality (declarative sentences); capacity (can); need (need); obligation (have 	

	<p>(got) to; imperative); permission (can; may); and intention (going to; will).</p> <ul style="list-style-type: none"> - Expression of existence: (there is / are); the entity (nouns and pronouns, articles, demonstratives); and the quality ((very +) Adj; (comparison (comparative and superlative: as Adj. as; smaller (than); the biggest)). - Expression of quantity: (singular / plural; cardinal numerals up to four digits; ordinal numerals up to two digits; Quantity: all, many, a lot, some, (a) few, (a) little, more, much, half, a bottle / cup / glass / piece of; Degree: very, too). - Expression of space: (prepositions and adverbs of location, position, distance, motion, direction, origin and arrangement.). - Temporary expressions: points (for example, quarter past five); divisions (for example, half an hour, summer), and indications (for example, now, tomorrow (morning)) of time; duration (for example, for two days); previousity (before); posteriority (after); sequence (first ... then); simultaneousness (at the same time); and frequency (for example, sometimes, on Sundays); prepositions, prepositional phrases and adverbs of time. - Expression of the mode: (Adv of manner, for example, slowly, well). 	
<p>HIGH FREQUENCY ORAL AND WRITTEN LEXICON</p>	<ul style="list-style-type: none"> - Transport. - Continents, countries and flags. - Environment, climate and natural environment. 	
#	TIMING	LESSONS OVERVIEW (3 weeks)
1	60'	<p>Drawing dictation to introduce the topic of the unit.</p> <p>Brainstorming.</p>

		Show resources of the unit.
2	60'	Design of CIA cards. Picture dictionary about natural disasters. Upload it to the webpage.
3	60'	Animated guide to natural disaster: how does a specific natural disaster happen? Work in groups. Show and Tell.
4	60'	Listening practice about natural disasters. Speaking cards.
5	60'	Quiz-quiz trade (cooperative learning activity) about natural disasters Future simple tense. Group and individual activities using the tense.
6	60'	Reading comprehension and video about climate change.
7	60'	Case study: preparation of a show and tell about specific natural disasters.
8	60'	Show and tells of case studies based on natural disasters. Kahoot!
9	60'	Escape room "Escape the Earth"

Apart from the previous features, there is a story connected to the unit which is going to work as the common thread in order to make the students participative. This story is the basis of the unit and it is going to allow the teachers to work with the different groups within the classroom. It is the following one:

“Welcome to the Central Intelligence Agency! You have been selected between thousands of people for a very important and secret mission in order to control natural disasters in the world. C.I.A. Official Agents have prepared all the resources you are going to need during this mission. They are all uploaded in the official webpage and you will be able to find everything you need given that it is going to be refreshed every day. As you are scientists, it

is needed you have an ID Card in order to be identified by the C.I.A. anytime you carry out a task. You have to create your own identification if you want to get signatures when you overcome a mission. The more signatures you get, the better. They will be useful for the final mission. It is very important to keep on studying and overcoming all the tasks destined for this mission. Are you ready? Your teacher will let you know everything about this mission. Good luck! The destiny of the world is in your hands!”

5.2.1 Approach activities.

This set of activities is carried out in order to get the students familiar with the unit and its story. They are essential for the development of the unit, although they can be modified in order to be suitable for any classroom and level.

LESSON 1

❖ Activity 1: Drawing dictation.

The teacher describes a scenario based on a natural disaster to the students; it can be anything: floods, earthquakes, tsunamis... It has to be described in detail. The students have to talk about the final picture: first in pairs, then, in small groups and finally with the rest of the classmates.

- Grouping: Individual and groups.
- Subjects involved: English, Natural Science, Arts and Crafts, Literacy.
- Materials: A piece of paper, pen, pencil, crayons.

❖ Activity 2: Brainstorming.

There is a topic suggested. The teacher asks a question or a fact about it and then gives time for the students to think possible answers. Taking turns, the students share their answers with the class. There can be more questions made by the teacher or the students.

- Grouping: Big and small groups.
- Subjects involved: English, Natural Science.
- Materials: Blackboard, chalks.

❖ Activity 3: Resources' presentation.

There is a time to present the resources that are going to be used along the unit and also to explain how they work, when and where they are going to be used. The main resource is going to be the webpage, which contains the story in which the unit is based on. It will be uploaded every day with the contents and activities for the unit. Then, it can be presented the tablets. This activity is carried out the first lesson, but anytime there is a new lesson, there might be some resources to present.

- Grouping: Big group.
- Subjects involved: ICT, English, Natural Science, Arts and Crafts.
- Materials: [Webpage](#), Tablets, Computers.

LESSON 2

❖ Activity 4: Central Intelligence Agency (C.I.A.) Cards.

There is a story which the unit is based on. There, the students are asked to create their own ID Cards. In groups, the students have to design an ID Card. The more groups there are in the classroom, the more designs there will be. The students can use their tablets or computers to design the cards. The teacher gives time to carry out the activity and at the end of the class, there is a contest where the students decide what design of the ID Cards they prefer. The final design is the one the teacher prints and the students have to fill in.

- Grouping: Small groups.
- Subjects involved: ICT, English, Literacy, Arts and Crafts.
- Materials: Tablets, computers, paper, pen, pencil, printer, laminator.

5.2.2 Development subtasks.

The following activities are carried out in order to go in depth into the unit with the students. They are a mixture of different subjects and abilities, which will allow teachers to achieve a complete learning process in the students about the unit. All of them are connected with each other, so the common thread is kept and the students can get profits when overcoming a task. At the end of every activity, the students have to present their ID Cards to the teacher, who will sign at the back of the card, so the students can have a record of their achievements. Those achievements will turn into benefits at the end of the unit.

LESSON 2

❖ Subtask 1: Picture Dictionary.

From the information gathered on the webpage about the different types of natural disasters, the students have to make a collage in PicsArts. They will need to collect some images of natural disasters from the internet and put them together into an only picture. After that, they will have to upload their picture dictionaries on the webpage.; English

- Grouping: Individual.
- Subjects involved: Natural Science, Arts and Crafts, Literacy.
- Materials: Tablets, Internet, PicsArts App, [Webpage](#), C.I.A. ID Cards.

LESSON 3

❖ Subtask 2: Animated guide to natural disasters.

The students have to make a presentation about how different natural disasters happen in nature. They need to gather information from the internet and some webpages suggested by the teacher. It is needed that they keep a record of all the information in a PowerPoint or any other similar format, so at the time of presenting is easier and more natural for them to talk about it.; English

- Grouping: Small groups.
- Subjects involved: Natural Science, Literacy, ICT, English, Natural Science.
- Materials: Tablets, Internet, Webpages, Tablets, Computers, Internet, PowerPoint, Word, C.I.A. ID Cards, [Animated Guide](#).

❖ Subtask 3: Show and tell. (Developed in Lessons 3 and 8)

It is a very simple activity that consists of presenting orally the students' presentations. In groups, they have to show and tell their classmates everything they have been working on based on the topic. They can use different digital resources in order to make them easier to talk about the topic and also to illustrate their discourse.

- Grouping: Small groups.
- Subjects involved: English, Natural Science, ICT, Literacy.
- Materials: Tablets, computers, digital whiteboard, C.I.A. ID Cards

LESSON 4

❖ Subtask 4: Listening practice.

It consists of a listening practice about the topic. This is an example which can be used in order to develop this activity, but there can also be found many podcasts or mp3 files on the internet about natural disasters. On this webpage, there are some complementary activities to do before, during and after the listening. It must be played at least twice to the students, depending on the difficulties they have along the activity.

- Grouping: Individual.
- Subjects involved: ICT, English, Natural Science.
- Materials: Tablets, computers, digital whiteboard, speakers, C.I.A. ID Cards, [Listening test](#).

❖ Subtask 5: Speaking cards.

It is very important that the students practice the language and also the vocabulary and expressions belonging to the unit. This activity consists of different cards with several questions and situations which prompt students to talk about varied aspects of the topic. It can be carried out individually or in groups, and also it can be asked by the teacher to do simultaneously or prepared from one day to another. The students choose a card randomly and the teacher reads the question in the card. Then the students have a time limit to talk about that aspect to the rest of the classroom.

- Grouping: Individual.
- Subjects involved: English, Natural Science.
- Materials: Speaking cards, C.I.A. ID Cards.

LESSON 5

❖ Subtask 6: Quiz-quiz trade.

This activity can be used as an ice breaker before starting a lesson, allowing the students to review the knowledges learnt in the previous lessons. It allows the students to change the routine and move around the classroom, which is very useful to improve their concentration and to create new neuronal connections. In this way, the students will be more relaxed and awake when starting the lesson. It is carried out in this way: the teacher asks the students to

clear the space between their tables and chairs, so it is easier for them to move within the space. Then, a music is played and the students are allowed to move, dance or sing around the classroom. When the music stops, they have to look for a couple to be with. Sometimes, it is necessary to make pairs of three people, in case of having odd number of students. When everybody is in pairs, the teacher asks a question about the topic and lets them a couple of minutes to talk to each other and find an answer. It doesn't always have to be a question, it can also be a situation the students have to talk about. Then, the teacher asks some pairs to share their answers and the activity starts all over again. It can be repeated as many times as the teacher or the students want.

- Grouping: Big group.
- Subjects involved: English, Natural Science, Physical Education.
- Materials: Computer, speakers, random music.

❖ Subtask 7: Future Simple Tense Practice.

English grammar worked in this unit was about Future Simple Tense. There were carried out different oral and written activities in order to practice the tense with the students. All the resources are uploaded on the webpage.

- Grouping: Big and small groups, individual.
- Subjects involved: English, ICT.
- Materials: [Webpage](#).

LESSON 6

❖ Subtask 8: Reading comprehension.

It consists of a reading practice about the topic. This is an example which can be used in order to develop this activity, but there can also be found many texts, articles or piece of news on the internet about natural disasters and aspects related to the unit.

There are some complementary activities to do before, during and after the reading comprehension. It can be read by the teacher or by some students in loud voice in order to assure everybody understands properly the text.

- Grouping: Individual.
- Subjects involved: English, Natural Science, Literacy.

- Materials: Reading comprehension text, piece of paper, pen.

LESSON 7

❖ Subtask 9: Case study

This activity is supposed to be like a little investigation about a concrete natural disaster happened around the world. It can be carried out giving the students a period of time to investigate and prepare a proper presentation about a case. In groups, they have to gather information, data, images, percentages... anything about different cases of natural disasters. They can use digital media in order to illustrate their presentations and make easier for them to explain all the information. The teacher suggests several natural disasters and raffle the cases between the groups. Then, the students have time (a lesson or a day) to prepare their presentations. When this time finishes, the students have to perform a show and tell about their case.

- Grouping: Small groups.
- Subjects involved: English, Natural Science, Literacy, ICT.
- Materials: [Webpage](#), webpages, tablets, computers, Internet, PowerPoint, Word , C.I.A. ID Cards.

LESSON 8

❖ Subtask 10: Kahoot!

Kahoot! Is a digital tool very useful to review contents in a motivational and attractive way for the students. They consider Kahoot! As a game or a competition where they can get a big amount of points when they click on the correct answer. There are many examples of Kahoot! Already done on the internet but it is also possible to create one based on what the students are learning. This is one which teachers can use. The students only need to enter the pin and their names, and automatically they can start playing.

- Grouping: individual.
- Subjects involved: English, Natural Science, ICT.
- Materials: Tablets, Internet, Kahoot!, C.I.A. ID Cards, [Kahoot! Natural Disasters](#).

5.2.3 LESSON 9: Final task.

Finally, at the end of the unit, there can be some activities that can be developed in order to finish the knowledges and dynamics corresponding to the topic. The number of these activities depends on the time teachers count on with to finish the units and also depends on several events that take place during the school year, corresponding to school activities, excursions and so. The main purpose of these kind of activities is to review the contents and knowledges acquired along the unit and also to apply them in order to solves different problems or situations. During this unit, the activities carried out were the following ones:

❖ Final task 1: Escape Room.

This activity consists of a game where the students have to work in groups in order to develop a mission. There is a video in which it is described all the steps they have to follow in order to solve the problem or enigma that is presented. In this case, everything is explained in the video. It is necessary to explain the rules before starting the game, so the students can find all the clues and solve the enigmas. These rules are the next ones:

- No force can be applied in order to get a clue or a hidden object.
- When they use a clue, it cannot be used anymore.
- They must follow the instructions in order to be able to solve the enigmas.
- They must work in groups and coordinate themselves to achieve a better development of the activity.

When the time is finished, nothing done after the time limit is valid.; English

- Grouping: Big and small groups.
- Subjects involved: Natural Science, Literacy, ICT, Physical Education.
- Materials: [Webpage](#), tablets, computers, Internet, digital whiteboard, speakers, [video presentation](#), box and padlocks, resources of the Escape Room, C.I.A. ID Cards.

❖ Final Task 2: Group reflexion about the unit.

This activity tries to get some feedback from the students and from the teachers to each other. It can be developed orally or using written format; individually, in groups or as a classroom. It is useful to collect results and opinions about the unit, the contents, activities... etc.

- Grouping: Big group.
- Subjects involved: English, Natural Science.
- Materials: No materials needed.

2.2.4 Materials.

In general, all the units developed in the classroom require materials that teachers need to be provided with at the time of teaching. Sometimes, these materials can be found in several sources: textbooks, webpages, magazines... but there are many times when teachers have to create those materials on their own. In the case of this unit, some of the materials are easily found in webpages such as the interactive games or listening and reading activities. However, there are some resources made by the teacher:

- **Webpage**: It was created by a webpage which allows users to create webpages for free, with many digital resources and designs. It is very easy to use, even without having much idea about programming webpages on the internet. The webpage of the unit is also simple for the students and allows them to see all the contents and digital resources easily. As it was said in previous parts of the design, it was uploaded every day, so the students could realise what things were new and which ones were there from the first days.



Figure 6: Webpage of the unit.

- **Kahoots**: Some of the done Kahoots on the internet are not precise, so for the unit the teacher made some examples in order to review the exact contents of the unit.
- **Escape Room resources**: The escape room consisted of several digital and non-digital resources that were personalised by the teacher in order to set them about the unit:
 - Video presentation: created by the programme *Moviemaker* and some images and music from the internet.

- Box: it is made of a carton box and decorated as it was an explosive device.
- Books: they were used as the clues to find out the passwords for the padlocks which opened the box.
- Maps: they were one of the clues to find out where the locations of bombs were. Each map was a puzzle based on a tangram, and behind the pieces were written the geolocations of the bombs.
- Encoded alphabet: each letter of the alphabet corresponded to a number. The students had to figure it out and decode other message written only with numbers.
- Questions with answers written with numbers: Using the previous clue, the students could decode the answers for the questions.
- Keys: There were two keys that opened a padlock and another box. They were hidden in the classroom.



Figure 7: Escape room box



Figure 8: Escape room hints

5.3 An experience based on gamification: Escape Room “Escape the Earth”.

The unit “Escape the Earth” owes its name to its last activity. According to the latest studies of education and innovation in the classrooms, there is a new resource that has been implemented as a game in the society, but also as a new way to demonstrate knowledges and put them into practice. This resource is the *Escape Room*.

An escape room consists of a game where the players have to escape from a room which is locked. There is a story set that allows the players to solve the different mysteries and there is also a time limit. The game finishes when the players escape from the room and also when

they solve the set of enigmas. If the time limit is over, the players lose the game. It seems to be very simple, but when playing it implies much effort and teamwork to carry it out.

Taking into account those premises, many teachers have brought the escape room into their classrooms as a resource to evaluate and motivate their students. Although it seems to be difficult to carry out, it is very easy to implement it in education due to it can be created about any topic or theme. There are many examples of this resource applied in education and nowadays it is turning into a tendency to take into account if we want our students to enjoy and to be motivated with what they are learning and doing at school.

In the previous part of developed activities, there is a little explanation about what the escape room was about in the unit. In this part, it is going to be explained in detail. It was developed the last day as the final activity of the unit and the students had no idea about that it was going to take place. This is the way the lesson was developed:

The teacher came into the classroom and after writing the date on the board, asked the students to get their CIA ID Cards, which should be under their tables. They were going to check how many signatures each group had, in order to talk about the benefits those signatures could give them. However, none of the ID Cards were in their places. The students started to ask the teacher what was happening, so the teacher asked them to get their tablets and check the webpage, in order to see if they could have their virtual ID Cards uploaded on the webpage and continue doing some review exercises. As they were taking the tablets, some of the students realised there was a new tab in the menu of the webpage. These students told the rest of the classroom that that tab called “CIA CONFIDENTIAL” was completely new and asked the teacher for permission to click on it.

The teacher waited for all the students to be on the webpage and then let them click on the new tab. After that, all of them were surprised because of what they were reading: “ESCAPE ROOM: ESCAPE THE EARTH”

The teacher told the students they were going to carry out an escape room based on the unit and explained them the rules required for the game:

- No force could be applied in order to get a clue or a hidden object.
- When they used a clue, it couldn't be used anymore.
- They must follow the instructions in order to be able to solve the enigmas.

- They must work in groups and coordinate themselves to achieve a better development of the activity.
- When the time was finished, nothing done after the time limit was valid.

After all these explanations, there was a video presentation that the teacher played on the digital whiteboard, set on the following story:

The Central Intelligence Agency (CIA) has recorded a video which starts with a kind of facial recognition and then it explains the story and the missions:

“C.I.A. ID Cards have been stolen. Please, try to recover them back and deactivate the bomb before it explodes. This mission is completely confidential. C.I.A. Secret Operations Centre has located a cyber bomb hidden inside a box in one of the main offices of the headquarters. The bomb is programmed to activate 6 explosive devices located in different parts of the planet earth, which will cause natural disasters in those zones and their proximities. Your missions as especial agents are the following ones:

- You must discover the global location of the 6 explosive devices.
 - You must open the padlocks of the box.
- You must find the key questions and answer them in order to deactivate the cyber bomb.

You have 45 minutes left until the bomb detonates. Be quick... the future of the planet depends on all of you.”

Once they watched the video, the time limit started: the students had 45 minutes to carry out the missions. They had to look for clues and things related to the mission. It could be anything inside the classroom, so they had to look carefully at things that were new or strange for them: new books, hidden things in the selves, walls, tables, keys... anything that could help them to solve the enigmas.

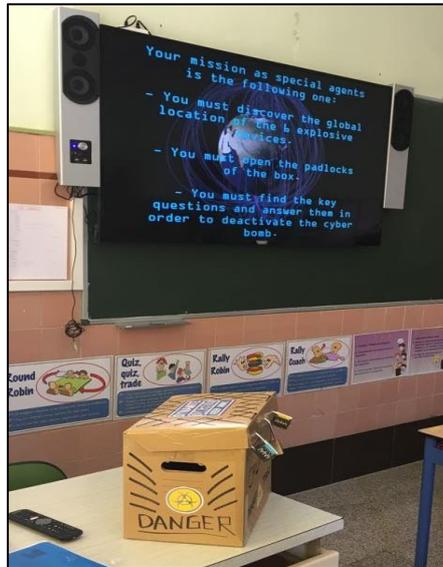
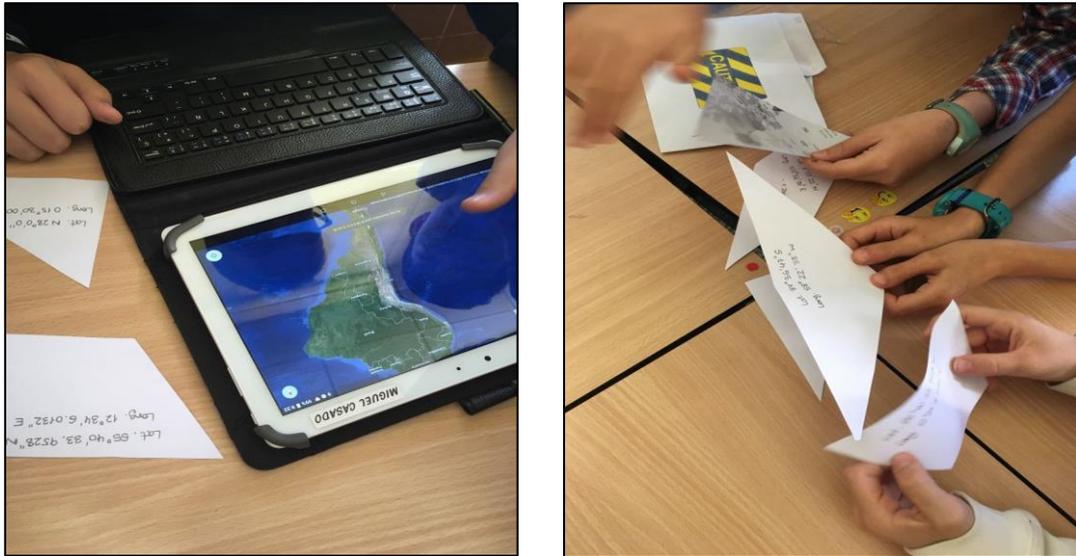


Figure 9: Escape room video presentation

It was necessary to make groups and solve some of the tasks within the escape room, fact that the teacher told them to do before the time started. The tasks of the escape room to carry out were these ones:

- **Look for two books:** each of them had blue and yellow stickers. One sticker in the page which number corresponded to one of the padlocks'. The books had a sticker in the front page with images relate to natural disasters. There were two padlocks with this kind of mechanism: blue and yellow.
- **Find two keys:** needed to open one of the padlocks and also a box hidden inside another box, which had the ID Cards and the map with the global locations of the bombs.
- **Find the alphabet clue:** which the students had to complete writing the numbers under the letters: A=1, B=2, C=3... It will help them to solve decode the answers for the key questions.
- **Find the envelope with the key questions:** which was inside the first box. They could read the questions, but the alphabet clue was essential to decode the answers.
- **Find the envelope with the map:** the map was a puzzle based on a tangram. Behind each piece there was a geolocation with latitude and length, corresponding to the places where the bombs were. The students had to put the pieces in order, find out where the bombs were using the geolocations and write them on the map. One of the clues the teacher gave during the development of the escape room was that they

could use their tablets to check what location those geolocations corresponded with in the earth.



Figures 10 and 11: Escape room tasks

Finally, when the students had overcome all the tasks, they had to open the red box (which was inside the carton box) in order to check if their answers were correct and also to recover their ID Cards hidden there. If the answers were correct, the time limit stopped and they could deactivate the cyber bomb.

5.4 Results.

5.4.1 Unit results.

From the very beginning of the unit, the knowledges and abilities that the students were working with could be seen within the classroom. Both groups were responding successfully to the tasks, developing the activities and enjoying the different dynamics and games. Although the unit should have last two weeks, it last nearly three weeks since there was a week with no class due to the festivities of the school. This event may have affected a little bit the unit development, but in the end, it was implemented successfully and the students participated very actively.

Both groups achieve the main aims of the unit, although they had different learning processes and rhythms. This fact made the teacher having to adapt what was planned in some lessons, using the time organisation in different ways sometimes. However, it didn't change the normal development of the unit, which got to an end satisfactorily.

5.4.2 Escape room results.

The escape room experiences carried out in both of the classrooms were developed successfully due to all the students participated and solved the enigmas. They all escaped counting on four and five minutes left till the time was up, which means the timing was accurate. However, although both of the groups did it well, there were many differences between them.

On one hand, one of the groups worked cooperatively and as a big team. Although they had to make some smaller groups in order to carry out different enigmas, they were sharing their results, looking for hints, comparing theories and helping each other in most of the times. They were so into the game and finally they could get away with four minutes left. There was a great connection between all the members of the classroom, which suggests the type of relationships that coexist within that group.



Figure 12: Cooperative work

They were able to apply their knowledge about what was taught during the unit in order to keep on solving enigmas and also, they were patient enough to look for the difficult tasks and researches.

On the other hand, the last group to carry out the escape room was a bit different from the first one. In this case, there could be seen the different kinds of players within the game. The students were playing different attitudes:

- Students who were motivated and actively participating in the game.
- Students who were not interested at all in the game and instead of being participating were bothering the rest of the classmates.

- Students who were into the game but didn't want to do much and let the others play for them.

Although it was a little bit difficult for them to get into the game at the beginning, at the end of it most of them were participating and solving the enigmas. In this case, teamwork worked in some of the groups of the classroom, but it was not too effective in the other part of the groups. However, they escaped with five minutes left and solving all the enigmas.

As a conclusion to this activity, it is important to highlight the good implication of the students during the entire escape room. They were very motivated and as the activity was going by, they were expressing that they were having such a good time doing it. This activity is perfect to see how much the students have learnt along the unit and how they apply what they know into the game. It can be considered as a sociogram, due to it allows the teachers to see how clear and defined the relationships between the students are.

5.5 Analysis of the unit proposal.

As any study or project, there are some aspects that make easier the implementation of this unit in new contexts or schools. They are important to be taken into account in order to adapt them to the new situation. As the previous activities, they can be modified, depending on the context teachers work with.

❖ Possibilities

The topic of the unit makes easier to find resources and online activities on the internet due to there are many examples based on real life that students can work with. Moreover, it is a unit that works all types of abilities and skills, working with multiple intelligences and in a cooperative way. These aspects make the unit easy to turn into a gamified experience, setting it about a story and with the students as the main characters of it.

It can be implemented in any bilingual school, teaching the same subjects this unit works with and also can be included another one, such as music. Depending on the level the teacher wants to teach the unit to, standards and contents belonging to the unit have to be adapted, as well as the difficulty of the activities.

❖ **Limitations.**

There are a couple of aspects that might have limited the final task of the unit. These are, on the one hand, the space. The classroom is a specific place with a determined area which cannot be changed or modified, so the activity has to be adapted to how it is. It could have been fantastic to have a changeable place to develop the escape room, full of decorations and effects that set the scenario, but that is not always possible. Also, on the other hand, another aspect is about the materials. Talking about materials not only means to have them prepared, but also to make them if it is necessary. Some of them can be found in the classroom itself, or maybe they can be bought. However, when there is a setting for an activity, the materials need to be done in order to adapt them to the activity it is going to be carried out. That involves teachers spending extra time in order to produce materials, and also involves budget, which is not always too high to spend it in producing materials.

Moreover, another limitation that can be found about the unit is technology. The school that wants to implement the unit has to count on with a minimum number of electronic devices such as computers, digital boards, speakers or tablets; which are going to be used during its development.

Lastly, in order to carry out all of the activities, it is needed that the students and the teachers have a proper knowledge of the language which the unit is implemented with. It is needed a minimum of English and also a knowledge of Natural Science.

5.6 Final considerations and possible changes.

Bearing in mind the results obtained and although it can be a difficult task to carry out, designing an experience based on gamification turns out to be a very rich and motivating experience for students and also for teachers. As it was developed during 3 weeks, the activities and dynamics had to be adapted to the timetable of the school. It would have been interesting to have had more time in order to perfect the design and the activities. It is also important to spend a time with the students in order to think about how the unit went for them: their appreciations about the topic, what they have liked most and least, their feelings... A bit of self and peer assessment about the entire process. This activity was carried out very briefly at the end of the unit, although it would have been better to make it last longer.

There are some possible changes that can be done whenever this unit wanted to be developed in other school context or situations:

- The setting of the story in which the unit and escape room is based on: instead of being scientists, the students can be part of the security forces and help people to survive situations of natural disasters; cyber bombs and bombs can be changed for other objects or situations.
- Rubrics: it could be useful for teachers, and also for the students to make a record of their consideration about the unit through a rubric. During the development of the unit there was no time to make a rubric for the students, but it is a good resource to assess the activities and have some feedback.
- Escape Room: the time established for the escape room was about forty-five minutes, which resulted good to solve all the enigmas. However, in order to have more tasks to develop within the game and to put into practice more contents, there would be great to have at least an hour of escape room.
- Badges and prizes: this unit counts on activities based on games and also with a gamified experience. However, in order to implement a whole process of gamification, it would be interesting to establish some aspects for the students in the classroom such as displays, badges, a ranking of points per groups or individually, a list of benefits and prizes (corresponding to the classroom development) that the students can get with their points... anything that makes the students more participative and motivated.

6. CONCLUSION.

As a result of this study, it is proved that nowadays the educational model has to be adapted to the real needs the students are requiring. The world is changing and people have to change with it, including our students. What was considered as new and innovative yesterday, it is out-dated today. That is something that teachers have to bear in mind when planning for their students.

Taking that into account and also all the theories about gamification explained in previous parts of this study, designing a new approach to education becomes possible. Basing a unit (or any other activities) as it was in this study on gamification changes the way the students perceive the contents and the whole learning process. Those aspects that could be not very

interesting for them, turn into new learning situations that allow them to participate more actively, being more motivated and looking forward to continuing learning.

Nowadays, teachers count on with many examples and information in which base their gamified proposals on. Many professionals in education have already implemented gamification within their classrooms, what helps the other teachers to have a reference. Of course, gamifying a classroom and planning activities based on gamification requires hard work and effort from the teachers, who are not able to develop these aspects sometimes.

However, as it was seen in this study, the results showed how different learning is when using these new models. They encourage the students to participate; students become motivated, empowered and participative, which allow them to develop their knowledges at their own pace and establish a better relationship between them and the teacher, and also between classmates. All those benefits make their learning process meaningful and qualitative.

Gamification systems are ideal for education and also, they perfectly comply with the LOMCE regulation in its methodological orientations: Learning must develop a variety of cognitive processes. The students must be able to put into practice a wide repertoire of processes, such as: identify, analyze, recognize, associate, reflect, reason, deduce, induce, decide, explain or create, avoiding that learning situations focus, only, on the development of some of them. Therefore, it can be guaranteed that taking a dose of fun through the game to the learning process achieves positive results in the students. It is evident that for those students who are already motivated, anything that is done, no matter how small, is going to have a positive impact. The problem always arises when there are students who tend to pass everything by and have no interest in anything that has to do with what is called school or study. Precisely for that kind of students, gamification was specially invented for.

In conclusion and going back to the main point of this study, gamification and similar models are something teachers should to continue learning from and implementing in education. The most important aspect within education is happiness: if we work hard and manage to have happy and motivated students, we will get them to have the best possible educational experience and a meaningful learning process.

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