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21st CENTURY SKILLS: INTEGRATING DIGITAL COMPETENCE IN THE SPANISH EFL PRIMARY EDUCATION CURRICULUM

Competencia Digital: Una propuesta para su integración en el currículo español de primaria del inglés como lengua extranjera

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RESUMEN

Pese a la multitud de investigaciones sobre competencia digital, pensamiento computacional y alfabetización digital, es latente una falta de aplicación de estos conceptos en la clase de inglés como lengua extranjera, así como propuestas para su integración. La bibliografía existente se centra de manera mayoritaria en los estudiantes de inglés como lengua materna o simplemente en la conexión entre la competencia digital y los ámbitos científico y matemático. Este trabajo de fin de grado explora actividades que permiten la integración de la competencia digital en la clase de inglés como lengua extranjera, con el objetivo de maximizar el horario lectivo e incluyendo varias metodologías de la enseñanza y aprendizaje del inglés, así como aquellos elementos de competencia digital más apropiados para los estudiantes de educación primaria. Este trabajo concluye no sólo que la integración exitosa de la competencia digital en el aula de inglés es posible, sino que puede, y debe, ser llevada más allá.

ABSTRACT

Despite the vast array of research on digital competence, digital literacy and computational thinking in schools, there is a lack of application of these concepts and proposals for their integration in the foreign language classroom. Existing literature mainly centers on L1 learners or simply connects digital competence to mathematics and science. This paper explores possible activities which allow the successful integration of digital competence in the English as a foreign language classroom, in order to maximize class time and including a variety of English teaching and learning methods, as well as those elements of digital competence most appropriate for Primary level English learners. This paper concludes not only that the successful integration of digital competence in EFL is possible, but that it can, and must, be taken much further.

PALABRAS CLAVE

Competencia digital, pensamiento computacional, soporte del aprendizaje, inglés como lengua extranjera, educación primaria

KEY WORDS

Digital competence, computational thinking, scaffolding, English as a foreign language, Primary education

1. INTRODUCTION

Digital technology has transformed the way we live, act, communicate and learn: according to the Spanish *Instituto Nacional de Estadística* (2019), or INE, 78,2% of Spanish women and 77% of Spanish men use the internet every day. Through these rapid changes has arisen a great need for digitally competent individuals in the workplace. This has not gone unnoticed by policy makers at the European Union, who in April 2019 published *DigComp: The European Digital Competence Framework*. This paper describes certain skills a person must have to be considered digitally competent. Through *DigComp* Spanish educational authorities were able to develop their own framework for digitally competent teachers: the so-called *Marco Común de Competencia Digital Docente* (Instituto Nacional de Tecnologías Educativas y de Formación del Profesorado [INTEF], 2017).

On top of the framework for teachers, many Spanish authorities have developed programs specifically aimed at digital competence, such as *IKANOS* -in the Basque Country[1]-, the program for technological alphabetization -in Extremadura[2]-, *Andalucía Digital* -in Andalucía[3]- and *ACTIC,* in Cataluña. Many of these programs are aimed at evaluating the digital competence of citizens and offer specific activities and classes, which are mostly aimed at adults.

Even with all these resources in place, there is a lack of practice in digital competence in Primary Schools: according to the *Ministerio de educación y formación profesional*, or the Spanish Ministry for Education (2018), 94,6% of all Spanish classrooms have an internet connection and 66,5% of all regular classrooms have Interactive Digital Systems but only 31,5% of all schools participate in experiences related to the use of educational technologies; This means the resources are in place, but teachers are not taking full advantage of them. The reasons for this vary, but mainly revolve, in this author's experience, around a lack of time and, in particular, around a lack of knowledge and confidence in the use of digital technologies. The idea that digital technologies are insurmountable must be eradicated in order to achieve full digital competence. Teachers must understand that digital competence can be achieved simply: for example, by teaching students to be careful in their use of the internet and not necessarily by the programming of a complicated robot. Students use technology every day and it is our duty, as teachers, to make sure they not only know how to use technology, but also know how it works, what risks are associated to their use or even how to create new technological tools, even if this requires an extra effort from teachers to acquire further, some might even say life-long, learning.

[1] For more information on *IKANOS: Competencias Digitales de Euskadi*, visit: https://www.ikanos.eus/
[2] For more information on *Plan de alfabetización digital de Extremadura: Competencia Digital,* visit: https://www.nccextremadura.org/competenciadigital/
[3] For more information on *Andalucía es digital: Formación,* visit: https://www.formacion.andaluciaesdigital.es

That said, there are many fears which surround the use of digital technologies by children and there are even restrictions in place to reduce their use in schools. This is the case in Madrid, where the use of mobile phones is banned on school property. However, as this paper will aim to prove, the teaching of Digital Competence does not necessarily mean the use of digital technologies, though they are a great advantage.

The importance of Digital Competence lies in the importance of understanding and controlling digital technology because of its status as a societal driver in this day and age. Wing (2008) underlines its importance for all members of society, precisely because users will not only be scientists and engineers, but all members of society, young and old, able and disabled, rich and poor, literate and illiterate. In fact, according to the *Ministerio del Interior*, or the Spanish Ministry of the Interior (2018), 91,3% of all children between the ages of 10 and 15 have used a computer in the last 3 months and 92,8% have used the internet in the same time frame. Therefore, because students will lead lives which are heavily influenced by technology, it is no longer enough to wait until students are in college or university to introduce concepts involved with digital competence (Barr & Stephenson, 2011).

Castells (2000) states that we are currently witness to one of the biggest technological revolutions to have ever taken place: namely the explosion of technologies relating to information and communication (ICT). Daily life is heavily influenced by said technologies, changing the way we act, produce, communicate, live and die. These technologies, which we use on a day to day basis, change the world around us, as well as the habits and thinking patterns of those who use them (Monereo & Pozo, 2010).

It is noteworthy that even if we do inhabit an ever increasingly digital world, the amount of people in engineering and STEM degrees is declining, especially in the ratio of women. Even though women represent 55,2% of all students in Spanish tertiary education, the gender gap is most visible in STEM and engineering fields. In studies related to engineering and architecture, men represent 72% of all students and in informatics the gap becomes even wider, with 88% of all students being male (Ministerio de Ciencia, Innovación y Universidades, 2019). The lack of women in STEM fields may root from the lack of references, with which stereotypes persist. Even though the gap is progressively getting smaller, it still seems like teachers may, through education, make changes in the social fabric of the country. One way to achieve a reduction of the gender divide is to motivate girls and increase their interest in the uses of technology. This could be achieved through the introduction of simple programming languages, such as Scratch, Tinker or Microbit, during school hours and not simply as an extracurricular activity, in order to make it an activity which all students must participate in.

So, both the European Union and the Spanish Educational Ministry seek to create digitally competent teachers, who may then teach their students in order to make *them* digitally competent. But what is Digital Competence? How do we achieve it? Can we teach Digital Competence if we are not digitally competent ourselves? Do we have time to include Digital Competence as a skill in the already broad primary curriculum?

This paper aims to provide simple examples and recommendations on how to include both digital skills and competence, as well as English as a foreign language (EFL) in one activity or session, in order to make learning not only more efficient, but more motivating and empowering. This responds to the idea that, to be useful, a definition must be coupled with examples, which demonstrate how computational thinking can be incorporated in the classroom (Barr & Stephenson, 2011).

Thus, in relation to the issues mentioned above, the aim of this undergraduate paper is to propose specific ideas for the integration of digital competence into the English as a foreign language Curriculum in Spanish Primary Schools.

2. OBJECTIVES OF THE DISSERTATION

2.1. General Objectives

A. To summarize and integrate the contents which reflect the competences acquired in the Primary Teaching Degree in order to create an organized proposal for the inclusion of some elements of digital competence to the EFL classroom.
B. To apply the content and didactic strategies to different areas of knowledge while integrating the development of digital competence.
C. To develop argumentative, scientific, reflective and critical thinking skills, particularly in relation to the adequacy of certain contents of digital competence for different age groups as well as, possible issues which may arise during classroom instruction.
D. To develop a project, which is at university education level, including scientific references and proposals which promote the inclusion of digital competence in primary education.
E. To develop skills and techniques for appropriate oral and written communication, mainly in the use of specific terminology relating to teaching and digital competence.
F. To use ICTs relevant to the teaching profession, especially those appropriate for the development of digital competence.

2.2. Specific Objectives

A. To provide evidence that digital competence can be integrated successfully into EFL teaching.
B. To propose projects and activities which integrate EFL and digital competence.
C. To develop a simple framework on why and how to introduce digital competence in the EFL classroom, which could be useful for teachers.
D. To substantiate the claim that digital competence is an important element of Primary Education.
E. To compile information that may foster motivation in teachers so that they may apply elements of digital competence in the primary school classroom.
F. To identify a set of learning activities that can promote the acquisition of English through increased student motivation by using digital elements.
G. To propose a series of scenarios in which students may naturally use English in order to achieve elements of digital competence.

3. THEORETICAL FRAMEWORK

Every teacher anywhere will say that the curriculum is too broad, and that time is short when teaching elementary school. They will say there is no time to include Digital Competence in Primary School, or even worse, that it is not necessary. As seen in the introduction, this is not the case. So, are we at a crossroads? It is the author's strong opinion that we are not, we simply need to incorporate these new 21st-century skills into the time frame we are already teaching in. There are copious amounts of proposals for the inclusion of Digital Competence in science subjects, most notably in mathematics, where the proposals range from gamification through Minecraft to full web pages with games and activities to practice mathematics, such as GeoGebra. But this paper aims to show ways in which Digital Competence can be included successfully in English language learning in all levels of Primary Education.

Throughout this theoretical framework some key questions will be addressed, while justifying the educational proposal below. Section 3.1. explores important aspects of Digital Competence, as well as why it is important to teach it in schools. Secondly, section 3.2. presents the connection between Digital Competence and Literacy. Thirdly, section 3.3. introduces the general classroom methodology employed in the educational proposal. Fourth, section 3.4. cites the specific classroom methodology and theoretical background relevant to each of the six proposals. Finally, section 3.5. puts forward the need for further activities in order to consolidate learning.

3.1. Digital competence

3.1.1. Defining Digital Competence

Digital Competence is one of eight key competences defined by the European Union (EU) as necessary for "personal fulfillment and development, active citizenship, social inclusion and employment" (European Parliament, 2006, p. 394/13). In a similar manner, *Bildung* can be defined as the combination of the elements of the personality and understanding of the world in a way that allows the achievement of a full life. *Bildung* has many definitions, but all of them generally include the following elements: knowledge and intellectuality, as well as culture and social concern (Bax, 2020), with the objective of preparation for how to act in the world (Tenorth, 2013). In other words, the eight key competences described by the EU lead to *Bildung,* making technological literacy an important element of general Primary Education.

Digital Competence is specifically defined by the EU as "the confident and critical use of Information Society Technology for work, leisure and communication" (European Parliament, 2006, pp. 394/15-394/16). According to this definition, Digital Competence does not simply rely on access, but on fully obtaining the benefits of digital technologies. Henceforth, Digital Competence depends on knowledge, skills and attitudes to be able to "use digital

technologies in a critical, collaborative and creative way" more than on simple access to the technologies in question (Kluzer & Rissola, 2015, p. 3).

3.1.2. The importance of teaching Digital Competence in schools

Firstly, article 5 of the Primary Curriculum for the Autonomous Community of Madrid defines Digital Competence as one of the basic competences for the stage. The others being: linguistic competence, mathematical, scientific and technological competences, learning to learn, social and civic competences, initiative and entrepreneurial spirit and social conscience. Teaching activities must be planned to integrate more than one of these seven competences (Consejería de Educación, Juventud y Deporte, 2014).

Furthermore, according to article 8, information and communication technologies must be worked on by way of a cross-curricular approach in every area (Consejería de Educación, Juventud y Deporte, 2014).

Again, in article 4, the Primary Curriculum establishes further objectives for this stage, of which the following are the most relevant for this proposal: (1) the initiation in the use of information and communication technologies and development of a critical spirit towards messages students receive and create, (2) the use of different artistic representations and expressions and initiation in the construction of visual and audiovisual constructions, (3) the acquisition of basic communicative competences in, at least, one second language, in order to express and understand simple messages as well as navigating everyday situations, (4) the development of affective and relational abilities, (5) knowing and understanding social norms and values and preparation for democratic citizenship, (6) the development of individual and group working habits, as well as responsibility, hard-work, critical thinking skills, personal initiative, curiosity and creativity, (7) the acquisition of skills for the prevention and resolution of conflicts and (8) the knowledge and understanding of cultural and personal differences, as well as the right to equality and non-discrimination (Consejería de Educación, Juventud y Deporte, 2014).

Equally important to what current Spanish legislation has to say about Digital Competence, there is a strong sociological element too: ICTs have not only conquered classrooms but also students' minds. However, this "invasion" is not homogeneous and there is a strong "digital gap" between students (Monereo & Pozo, 2010, p. 110). Castells (2001, p. 247), states that "the centrality of the Internet in many areas of social, economic, and political activity is tantamount to marginality for those without, or with only limited, access to the Internet, as well as for those unable to use it effectively" and adds that the "digital divide" aggravates existing inequalities. According to Eurostat (2019), in 2018, 86% percent of all households in Spain had access to the internet, the European mean being 89%. Consequently, we can state that access to the Internet does not cause this "digital gap" in Spain, however, access to technology does not necessarily ensure the acquisition of digital knowledge, skills or

competence. Therefore, the digital divide is not really present in access, but more so in its effective use. Though the use of ICTs has been democratized, the same has not happened with the competences related to their use: UNICEF (2018) relates that children in Spain have broad access to ICTs and are capable of using them but are not aware of the risks and are not capable of searching, filtrating or creating content. This is especially relevant since statistics show that incidents of cybercrime have nearly doubled since 2015 (Ministerio del Interior, 2018).

Moreover, even in 2018, the fact that 20,5% of households in Spain don't have access to a computer (Ministerio del Interior, 2018) and 13,6% don't have access to the internet means that a substantial share of the population is excluded from regular access to the digital realm. In fact, Spain is under the EU mean in terms of access to the Internet. It is reasonable to believe that these percentages correspond to older generations, where the percentage of use of the internet is 49,1% for people ages 65 to 74. However, there is also a strong difference (approximately 10%) in access between rural and bigger urban areas (Ministerio del Interior, 2018). During the lockdown caused by the Covid-19 outbreak, schooling has had to be turned to an online modality, which exacerbates inequalities in education which, in turn, stem from inequalities in access by the parents.

One area of the "digital divide" which is especially important is that referring to disability. Accessibility is not always a priority when developing digital technologies and educational software, which causes a worsening in the "digital gap" for people with disabilities, reducing their educational and work opportunities (Ferreira & Díaz Velázquez, 2009).

Because primary schooling is mandatory, this makes it the perfect scenario for an introduction to Digital Competence on an equal footing, or at least, the most equal footing possible.

3.1.3. The basic elements of Digital Competence

In 2013, the European Commission developed its first reference framework aimed at describing the knowledge, skills and attitudes that people need to be considered "digitally competent". This reference framework is called "The European Digital Competence Framework for Citizens" (DigComp).

The framework has been updated over the years and the most recent framework was published in 2018 (DigComp 2.1.). It establishes five competence areas which are divided into three general ones: Information and Data Literacy, Communication and Collaboration, Digital Content Creation; And two cross-curricular ones: Safety and Problem Solving. These competence areas then feature 21 specific competences (Vuorikari et al., 2016).

Table 1. Competences in The European Digital Competence Framework for Citizens

GENERAL COMPETENCES	
Information and Data Literacy	Browsing, searching and filtering data, information and digital content Evaluating data, information and digital content Managing data, information and digital content
Communication and Collaboration	Interacting through digital technologies Sharing through digital technologies Engaging in citizenship through digital technologies Collaborating through digital technologies Netiquette Managing digital identity
Digital Content Creation	Developing digital content Integrating and re-elaborating digital content Copyright and licenses Programming
CROSS-CURRICULAR COMPETENCES	
Safety	Protecting devices Protecting personal data and privacy Protecting health and well-being Protecting the environment
Problem Solving	Solving technical problems Identifying needs and technological responses Creatively using digital technologies Identifying digital competence gaps

Table created by the author and based on the User Guide to the European Digital Competence Framework (Kluzer & Pujol, 2018)

When creating proposals relating to DigComp teachers must follow three steps, two of which are especially important for the present thesis: firstly, a clear identification of the users' needs and goals must take place, identifying their characteristics and the goals of the initiative and finally producing a "list of targeted digital competences and levels" (Kluzer & Rissola, 2015, p. 23). This element is, as in any lesson plan, particularly important, since the intervention or activity will be very different depending on the year of application. Secondly, this list must be "mapped onto DigComp", relating the teachers' objectives to those expressed by the framework and thirdly, DigComp must be "translated" by specifying the goals to fit the target user and defining the proficiency levels which one is aiming to achieve (Kluzer & Rissola, 2015,

pp. 23-24). Accordingly, content and tools must be adapted to the target group. For the purposes of this paper, DigComp elements were taken directly as competences, making step two unnecessary. However, each activity described in the educational proposal is paired with the objectives described in steps one and three.

3.1.4. The proficiency levels of Digital Competence

The DigComp 2.1 framework describes eight proficiency levels through learning outcomes, which follow Bloom's Taxonomy (Carretero et al., 2017) in its 2001 revised version. Both these versions of the taxonomy follow an order of increasing complexity, meaning that higher order thinking skills, or cognitive domains, build on the lower ones (Bloom, 1956). The levels which coincide with the cognitive domains "represent a step up in citizens' acquisition of the competence according to its cognitive challenge, the complexity of the tasks they can handle and their autonomy in completing the task" (Carretero et al., 2017, p. 12).

Table 2. Proficiency levels described in the European Digital Competence Framework

4 OVERALL LEVELS	Foundation		Intermediate		Advanced		Highly specialised	
8 GRANULAR LEVELS	1	2	3	4	5	6	7	8
COMPLEXITY OF TASKS	Simple task	Simple task	Well-defined and routine tasks, and straightforward problems	Tasks, and well-defined and non-routine problems	Different tasks and problems	Most appropriate tasks	Resolve complex problems with limited solutions	Resolve complex problems with many interacting factors
AUTONOMY	With guidance	Autonomy and with guidance when needed	On my own	Independent and according to my needs	Guiding others	Able to adapt to others in a complex context	Integrate to contribute to the professional practice and to guide others	Propose new ideas and processes to the field
COGNITIVE DOMAIN	Remembering	Remembering	Understanding	Understanding	Applying	Evaluating	Creating	Creating

Source: User Guide to the European Digital Competence Framework (Kluzer & Pujol, 2018)

However, mastering the "highly specialized" level would greatly exceed the objectives of Primary Education, therefore, the activities described in this dissertation are mostly centered on the "foundation" and "intermediate" levels of Digital Competence.

Since the taxonomy follows an order of increasing complexity, carrying out the higher order skills (understood here as: evaluating and creating since the DigComp 2.1 framework does not include the "analyze" level as described by Anderson et al., 2001) necessarily includes carrying out the lower (understood here as remembering, understanding and applying).

3.2. The relationship between Digital Competence and Literacy

The question remains: why language teaching? Why not, for instance, mathematics? Firstly, as expressed at the beginning of this segment, the use of ICTs in mathematics and science education is already broadly studied and practiced, through GeoGebra, Minecraft, MicroBit or WWF Free rivers, to name a few.

Secondly, through the new age of technology, the definition of literacy must be revised. According to the International Reading Association (2001, cited in Coll & Rodríguez Illera, 2010) ICTs have changed and redefined literacy, meaning that in order to be completely literate, students must be *technologically* literate.

Thirdly, if we understand coding as "preparing instructions for a computer to understand" (Burke et al., 2016, p. 371) we understand coding as an extension of language, the idea being to "talk to a computer". Coding is a small part of programming and therefore a small part of Digital Competence, but it is what people associate most with digital competence and digital literacy. Moreover, it may be a small element, but it is a constructive one: through the knowledge of how computers work, people become more "discerning users" (Burke et al., 2016, p. 372) and build on many of the other skills inherent to Digital Competence, making it an important base. Since the ultimate focus of this study is to relate Digital Competence to the Primary Education curriculum, it makes most sense to relate the basis of Digital Competence to language learning.

3.3. General classroom methodology

3.3.1. CLIL and CoBaLLT

The acronym CLIL stands for "content and language integrated learning". In this method, students learn content with and through language and vice versa (Harmer, 2012, p. 226). Therefore, both language and content are important in a CLIL lesson. Taking this into account, CLIL lessons are most effective when both of these elements are closely connected and, in general, students are only taught the language necessary for the specific lesson (Harmer, 2012). CLIL classrooms aim at creating learning environments, which are linguistically accessible while being cognitively demanding (Coyle et al., 2010). This method was chosen for this paper because of its widespread use in bilingual schools in Madrid.

Some other important elements to make CLIL successful are careful planning, enough resources and offering enough support to all students (Ball et al., 2015).

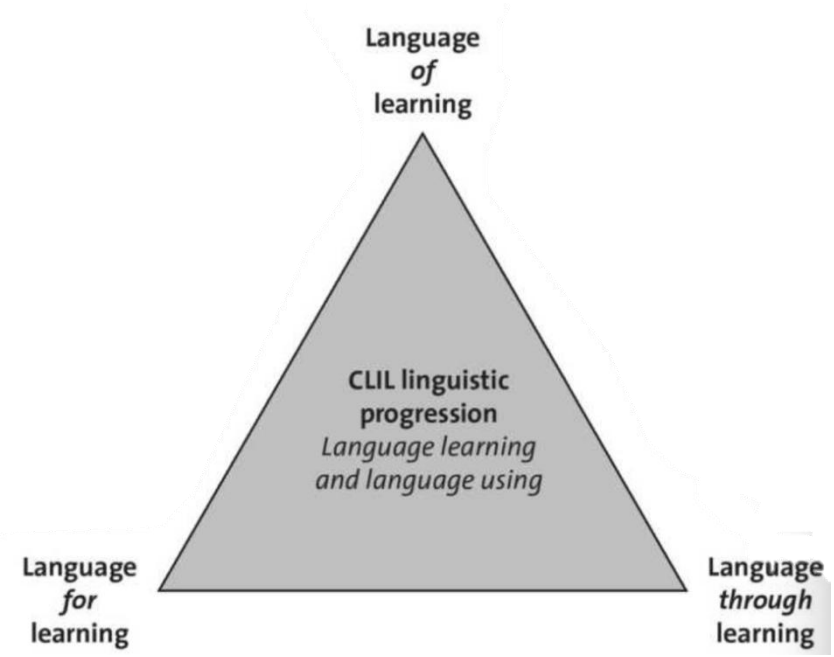
CoBaLLT stands for "content based language learning through technology" and is a variant of CLIL in which teachers are encouraged to use a "wide variety of technological resources to reach their curricular objectives" (Reynolds, 2015, 2.9.18). The objective is to integrate

technology into teaching in order to "develop learners' understanding of the content, culture and language use" (Reynolds, 2015, 2.9.18).

For the purposes of this paper, the author has blended both CLIL and CoBaLLT, teaching content, also known as Digital Competence, through language and sometimes, using technological resources to achieve this goal.

CLIL is composed of four elements, known as the 4 Cs: content, cognition, communication and culture. In order to connect the 4 Cs, CLIL classrooms use what is known as the Language Triptych, this pyramid is composed of three distinct types of language (Coyle et al., 2010): of learning, for learning and through learning. Language of learning describes what language students need to access new knowledge, such as key vocabulary related to the content as well as how learners will need to use said vocabulary. Language for learning is composed of all language the students need in order to work in a particular learning environment. Finally, language through learning defines all new language which appears through the learning itself.

Image 1: The Language Triptych



Source: Coyle et al., 2010, p. 93

Each activity proposed in this paper is led by the 4 Cs, which are illustrated in a table per proposal.

3.3.2. Scaffolding

This dissertation provides 6 different activities which each work one particular element of Digital Competence. Each activity is aimed at one grade of primary education because each grade and age have specific characteristics which must be taken into account in order for the

application to be successful. In pursuit of this success, each activity is adapted to the evolutionary level of the child (Vygotsky, 1970), this process is known as “scaffolding”.

The process of development in the brain is carried out by complex neural circuits being built on previous, simpler ones (Marchesi et al., 2018), this is why learning is always gradual. Accordingly, human development is somewhat organized: certain changes happen in all humans at about the same evolutionary stage, though each individual develops at their own rate and differences based on environmental influences must be taken into account (Muñoz Tinoco et al., 2014).

However, students are able to carry out many actions which exceed the limits of their own abilities, be it by carrying them out collectively, through imitation of an adult or under adult supervision (Vygotsky, 1970). The learning which occurs under these circumstances happens in the so-called “Zone of Proximal Development” (ZPD).

ZPD responds to Vygotsky's idea that learning oriented to educational levels which have already been acquired is ineffective, since it does not work towards the complete development of children. Following the idea of development expressed above: without ZPD new complex neural circuits would never be built on older simpler ones. What is more, Vygotsky (1979, p. 138) describes “good learning” as that which precedes development.

This idea is also supported by Spector (2010, p. 5), when he states that “learning environments should be designed to enable learners to explore and construct knowledge and develop problem-solving methods independently”. Therefore, the key to success is not in how education is presented, but in how well learners can manipulate the tools available.

Therefore, teachers must evaluate what students “could do”, as opposed to what they are already able to do when planning activities. In view of all the above, the activities presented will be adapted to the age of the children they are aimed for, while still being challenging. They will also mainly be student-centered and allow for individual exploration and discovery.

3.3.3. Student-centered learning

According to Williams (2009), and from a perspective relevant for the present purposes, student-centered learning is a classroom management strategy based on supporting autonomy and freedom. In these classrooms the teacher allows students to solve problems while still being an active part of student learning (Williams, 2009, p. 13).

Furthermore, student-centered learning requires a competency-supportive classroom, in which students are offered “worthwhile and meaningful tasks that cause students to take risks” (Williams, 2009, p. 24) as well as enough time, resources and autonomy to be creative. This is also one of the most important elements of language learning, known as “personalization”,

in which students use the new language they have learnt to talk about things which are relevant to them (Harmer, 2012, p. 90).

The autonomy and agency which is intrinsic to this methodology is also claimed to promote student motivation (Harmer, 2012), which is one of the most important factors in achievement (Castejón et al., 2013). According to Castejón et al. (2013) student motivation is promoted because students are immersed in an educational setting which has a clear objective as well as a clear perceived usefulness.

3.3.4. Cooperation

Social relationships are vital during childhood, since humans are social beings. Social learning develops during childhood, through the process named "socialization" (Perinat Maceres, 2014). In this sense, students in primary education should be encouraged to engage in collaboration and interact with classmates when learning.

Cooperative learning is based on constructivism and is defined as a classroom management strategy centered on small heterogeneous groups in which students collaborate in order to achieve a task (Iglesias Muñiz, 2017). These classrooms use the social nature of the children in a class as a tool in order develop the students' individual competence: they learn individually but work cooperatively by helping each other and trying to achieve a common goal.

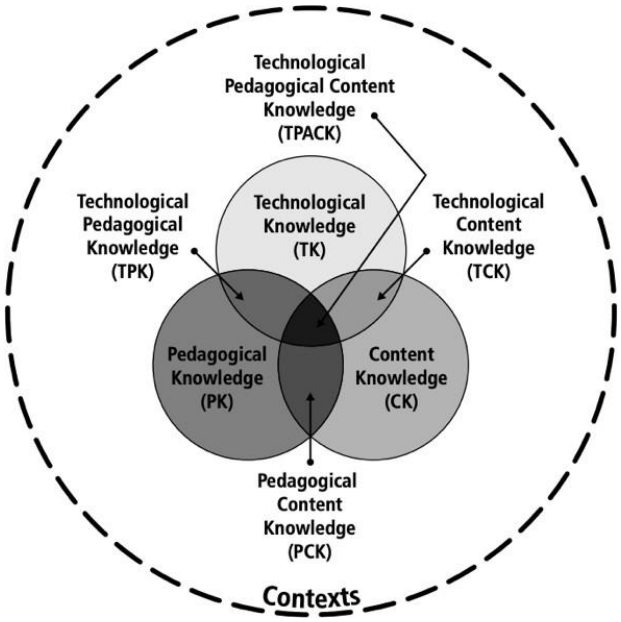
On top of the perks of cooperation for student socialization, there is another clear benefit, which is the promotion of inclusive education. Through the application of cooperation, inclusion is facilitated because this methodology naturally places students as active agents of their own learning, whose diversity is a strength and not a problem (Iglesias Muñiz, 2017).

In this sense, all activities proposed in the following dissertation are based on collaborative learning.

3.3.5. The TPACK Model

When using any kind of technology in the classroom it is important that teachers keep the TPACK Model in mind. This model describes the three components of teacher knowledge important when teaching through and with technologies (Koehler et al., 2013): (1) content knowledge, the teachers' knowledge about the subject, (2) pedagogical knowledge, the teachers' knowledge about methods and techniques of teaching and learning, and (3) technological knowledge, which is in constant change and cannot be easily defined, but will be understood for the purposes of this paper as digital competence.

Image 2. The TPACK Model



Source: Koehler et al., 2013, p. 15

In reality, all teachers integrate the three main elements when planning and teaching, since they will always evaluate what, how and why they are teaching a certain topic. But the introduction of digital technologies incorporates new elements: (1) technological content knowledge requires understanding the impact of technology on certain disciplines (Koehler et al., 2013). For example, the widespread use of abbreviations in digital communication changes the way people communicate, therefore also changing foreign language learning; (2) technological pedagogical knowledge requires "understanding how teaching and learning can change when particular technologies are used in particular ways" (Koehler et al., 2013, p. 16); Finally, (3) technological pedagogical content knowledge requires using technology for effective teaching.

3.4. Specific classroom methodology

In the following section some specific theoretical background, as well as some specific competences from the Madrid Primary Curriculum will be provided, one for each of the years which build Primary Education in Spain. All of the proposals which will be described below aim to develop both Digital Competences, as described by *DigComp*, and specific competences for English as a foreign language. When relevant, some competences pertaining to other curricular areas are also included, as a cross curricular element. These competences are exposed in a table for each proposal.

3.4.1. First Year Proposal

Table 3. Competences included in The Grinch versus the Robot activity

The Grinch versus the Robot			
Competences			
Digital Competence	Digital Content Creation	Programming	Competence Level: Foundation and intervention levels 1 through 3 depending on the students level.
	Problem solving	Solving technical problems	Foundation levels 1 and 2
Primary Curriculum	English	Understanding of basic sounds and messages in the English language Knowledge of basic phonetics and sounds in the English language through basic words and sentences Transmission of simple words and sentences with correct enunciation, accents and rhythms Use of basic classroom sentences and basic vocabulary Use of the conjunctive word “and” Creation of affirmative sentences Creation of negative sentences with “not” Creation of exclamatory sentences Creation of “Wh-questions” Expressions of modality Expressions of existence Expressions of space	
	Mathematics	Locating parts of one’s own body and describing objects in space relating to oneself Executing provisions in terms of “in front of, behind, up, down, right and left” in various psychomotor exercises: looking, turning, walking etc. Describing and recognizing the location of an object in relation to another	
	Physical Education	Adaptation of movement to various environments, such as activities of orientation Development of fundamental movement abilities	

Table created by the author and based on the Madrid Primary Curriculum and the DigComp into action user guide.

So far, there is no single and widely accepted definition for the term “computational thinking” (Barr et al., 2011, p. 21), the term was first introduced by Jeanette Wing in 2006 as “solving problems, designing systems, and understanding human behavior, by drawing on the concepts fundamental to computer science”. It is, according to Wing (2006, p. 35), understanding “what can be computed and how to compute it”. This definition is further specified by Barr et al. (2011, p. 21) as a “problem-solving process” which is cross-curricular and includes attitudes, such as confidence dealing with complexity, persistence or the ability to communicate with others in order to achieve a common goal.

Wing (2006, p. 35) underlines in her definition that, when referring to computational thinking, one is talking about “conceptualizing, not programming”, meaning that the objective is not just to program, but to achieve multiple levels of abstraction. Therefore, it is not explicitly related to the use of technology (Valverde Berrocoso et al., 2015), even if technology allows for new and previously impossible tasks.

Wing is also a firm believer in the need for teaching computational thinking in the early years of childhood in order to “ensure a common and solid basis” (Wing, 2008, p. 3720). With this in mind, the first-year activity will be focused on the development of computational thinking as a previous stage for learning of programming.

In order to scaffold the acquisition of computational thinking, the first-grade activity will be carried out through collaborative teamwork and with explicit use of the following elements (Barr & Stephenson, 2011, p. 51): decomposition, by “breaking down problems into smaller parts that may be more easily solved”; and consensus building, by “working to build group solidarity behind one idea or solution”.

CS Unplugged is an online platform developed by the University of Canterbury, in New Zealand, in connection with both Google and Microsoft. The platform publishes learning activities which promote the learning of computer science without the need for actual computers[4]. *CS Unplugged* makes connections to computational thinking in its activities, in that it “teaches students how to: describe a problem, identify important details needed to solve this problem, break the problem down into small, logical steps, use these steps to create a process that solves the problem and then evaluate this process”[5]. The activity proposed is based on the principles followed by this platform, which proposes the cooperative learning of computing and computational thinking by doing and without the need for specialized equipment or computers.

There is no real proven objective benefit to the use of technology in infancy (Medellín, 2019), this does not mean technology is detrimental, however the new constant access to technology children are exposed to places parents and educators in an “experimental phase”, in which they must act prudently when incorporating these technologies in education (Medellín, 2019, p. 12).

[4] For more information on *CS Unplugged* visit: https://csunplugged.org/en/principles/

[5] From *Computational Thinking and CS Unplugged*. For more information visit: https://csunplugged.org/en/computational-thinking/

This proposal also responds to the principles of *holistic education* (Ganzheitliche Bildung) as described by Pestalozzi (Bacher, 2012). This author believed in learning through "head, heart and hand", which involves learning through the involvement of feelings and all senses. One of the building blocks of the activity is movement as an essential part of language learning. In this respect, the proposal is based on two basic principles also shared by the Total Physical Response model: firstly, that "understanding should be developed through movements of the students' body" (Asher, 2012, pp. 2-4) and secondly, that children are better foreign language learners when they are motivated and not stressed (Asher, 2012).

This last principle is also supported by Bacher (2012), who states that introducing a good learning atmosphere, where students can develop their social competences, is paramount for effective teaching practice. Games are a resource for creating these rich learning atmospheres, since it is during games when all dimensions of human development collide and allow for the practice of previously learnt elements (Ridao et al., 2016) with an intrinsic motivation which is hard to find in other tools and methods. This motivation is of great importance, since students of this age group are usually only capable of concentrating on a learning task for some minutes, and only if the tasks are entertaining (Ridao Ramírez & López Verdugo, 2014).

However, in order for an activity to be considered a game, it must, according to Ridao et al. (2016), meet a series of criteria: it must be fun, have some freedom, be charged with fiction, be serious and relevant for the children involved, require a certain amount of work, have action in the foreground and establish the process as more important than the result.

The students this activity is aimed at will find themselves in the middle of the preoperational stage and the stage of operant conditioning, as described by Piaget (1973). They are learning to "de-center" their attention, focusing on more than one aspect of reality at once (Ridao Ramírez & López Verdugo, 2014), this is fundamental for the students' development, since it is the basis through which childhood egocentrism is overcome (Martí, 2014). This activity directly challenges the "programmers" to look beyond their perspective and think in terms of what the "robot" sees. It is, in essence, the task of three mountains.

3.4.2. Second Year Proposal

Table 4. Competences included in the Digital Picture Books activity

Digital Picture Books			
Competences			
Digital Competence			Competence Level
	Communication and collaboration	Sharing information and content through digital technologies	Foundation levels 1 and 2
	Digital Content Creation	Developing digital content Integrating and re-elaborating digital content	Foundation and intervention levels 1 through 3
	Problem solving	Creatively using digital technologies Solving technical problems	Foundation levels 1 and 2
Primary Curriculum	English	Use of capital letters and punctuation marks Writing of simple texts through modelling Care in the presentation of texts Directed writing of basic vocabulary Use of ICTs Expression of logical connectors Affirmative, exclamatory and negative sentences Use of the simple present Expressions of existence, time and place	
	Artistic education	Using ICTs responsibly for the search, creation and diffusion of still and moving images	
	Natural Science	Explaining the general characteristics of vertebrate animals Identifying animals from the different feeding groups	

Table created by the author and based on the Madrid Primary Curriculum and the DigComp into action user guide.

According to Wright (1990), the use of pictures in the EFL classroom offers many advantages: (1) they foster motivation and make students want to take part in classroom activities, (2) they contribute to the context, in which the target language is being used, (3) pictures can be interpreted subjectively or described objectively, (4) they help in controlled practice, and (5) they are stimulating, as well as providing information.

In this case the students concentrate on what is known as “mechanical language practice”, with the images serving as stimulus and motivation (Wright, 1990, p. 18).

In order for this activity to be most successful it is advisable that teachers read to their students often. The class’ contact with “authentic” picture books will allow not only for a reference point on which to base their own productions, but also as inspiration. This reading constitutes what is known as “looking at art”, during the activity the students “create art” and finally they “share art” by publishing their finished books on the website (Lightfoot, n.d.).

The teacher must act as a guide, as established by the principles of student-centered learning, making the experience fundamentally interactive and making sure not to guide the students to the teachers' preconceived notions of what their final product should be: in this case "variability of outcome is key" (Eisner, 2002, p. 196).

Establishing feedback is particularly important (Gregori-Signes, 2014), since it will allow students to create better stories and, thereby, become better communicators.

Another key element in this exercise is the non-separation of the content and the form. When students unite images with text, they are creating multimodal productions as a whole, in which text is directly related to the images.

3.4.3. Third Year Proposal

Table 5. Competences included in the Music Game Padlet activity

Music Game Padlet			
Competences			
Digital Competence			Competence Level
	Information and Data Literacy	Browsing, searching and filtering data, information and digital content Managing data, information and digital content	Foundation levels 1 and 2
	Communication and Collaboration	Sharing through digital technologies Collaborating through digital technologies	Foundation levels 1 and 2
	Digital Content Creation	Developing content	Foundation levels 1 and 2
Primary Curriculum	English	Emission of simple words and messages with correct pronunciation, accent, tone and rhythm Use of basic sentences for the exchange of basic information Basic vocabulary Reading of simple messages and key vocabulary Use of capital letters Writing of short words Use of dictionaries and ICTs Expression of logical connectors Affirmative sentences Negative sentences Expressions of quantity Expressions of space Expressions of time Expressions of mode	

	Musical Education	All competences included in the curriculum could be included and greatly depend on the games which are found

Table created by the author and based on the Madrid Primary Curriculum and the DigComp into action user guide.

Though a great majority of students enjoy music, this interest does not necessarily translate into the music classroom (Hein, 2014). In order to make learning more engaging and promote motivation, teachers may use games, which usually have the clear advantage of instant feedback.

Moreover, some students may feel performance anxiety when creating and performing music. Games avoid this "feeling of failure" because the creation and performance are introduced in music games in order to promote learning (Gee, 2007, as cited by Tobias, 2012).

When teaching music, Green (2002, as cited by Egenfeldt-Nielsen, 2007) proposes the integration of "pop-oriented pedagogical practices into formal music education for young students", through (Hein, 2014, p. 98): (1) immediate feedback, (2) complete student attention, (3) concentration, (4) combination of control and freedom, and (5) lack of self-consciousness.

Generally, the use of educational and entertainment platforms is named "edutainment" (Egenfeldt-Nielsen, 2007, p. 264). The concept is broad, but generally refers to the use of games, which are created only for educational purposes. *Edutainment* is not considered to be particularly more effective than traditional learning materials, though it does increase motivation and interest (Hein, 2014). According to Egenfeldt-Nielsen (2007), *Edutainment* presents certain issues, such as the fact that teachers are not present, that game-play is simple or that the learning principles follow so-called drill-and-practice learning principles. However, due to the fact that the main focus of this activity is increasing motivation for music, the drawbacks of these games can be temporarily overlooked.

According to Barudy and Dantagnan (2005), communication is one of three specific needs of children. Through communication children learn what they need in order to become part of a specific social and cultural context. This is to say, children need communication in order to feel as a part of their social system. Therefore, children should be encouraged from a young age to communicate and establish appropriate spaces for debate, reflection and self-expression. With this in mind, this activity aims to promote communication and debate in the student groups.

Kiddle is a search engine created for children. It is visual and safe, and though it does not belong to Google, it works by applying Google Safe Search. The search engine only includes secure sites, sorting the results by origin: firstly, it shows content, which is specifically made

for children, secondly, content which is simple but made for adults and thirdly, content which is difficult and made for adults.

Padlet[6] is an online platform which allows for the creation of collaborative boards and documents. It is an easy platform to use, and though it is not created exclusively for educational or student use, offers many possibilities for classroom use. It is important when using this platform that teachers previously ask the parents for permission, since the company terms of service explicitly state that use by children under 13 years old is only allowed in educational settings and under direct supervision from parents and guardians. Furthermore, the company explicitly "(relies) on parents and guardians to ensure minors only use the Service if they can understand their rights and responsibilities as stated in (the terms of service) and (…) Privacy Policy"[7].

3.4.4. Fourth Year Proposal

Table 6. Competences included in the Scratch activity

<table>
<tr><th colspan="4">Scratch</th></tr>
<tr><th colspan="4">Competences</th></tr>
<tr><td rowspan="3">Digital Competence</td><td></td><td></td><td>Competence Level</td></tr>
<tr><td>Problem Solving</td><td>Solving technical problems
Identifying needs and technological responses
Creatively using digital technology</td><td>Foundation and Intermediate levels 1 through 3 depending on student level</td></tr>
<tr><td>Digital Content Creation</td><td>Programming
Developing content</td><td>Foundation and Intermediate levels 1 through 3 depending on student level</td></tr>
<tr><td>Primary Curriculum</td><td>English</td><td colspan="2">Understanding information from multimedia and ICTs sources about simple topics
Basic vocabulary
Use of ICTs as a means for learning</td></tr>
</table>

Table created by the author and based on the Madrid Primary Curriculum andthe DigComp into action user guide.

Scratch[8] is a free computer programming language, which was created by the Massachusetts Institute of Technology (MIT), as a process centered system for creative computing. It is built as a visual and intuitive programming language based on blocks. The creators state that the platform helps learn creative thinking, collaborative work and systematic reasoning. In addition,

6 For more information on *Padlet*, visit: https://es.padlet.com/

7 For more information on the *Padlet terms of service*, visit: https://padlet.com/about/terms

8 For more information on *Scratch*, visit: https://scratch.mit.edu/

the use of Scratch supposedly promotes technological literacy, which we will define, following the words of Davies (2011, p. 47), as “the ability to effectively use technology to accomplish required learning tasks”. Furthermore, the level of abstraction required in Scratch is not the same as in other programming languages, such as Java, C or Python, due to its highly intuitive and visual nature, making it especially suitable for the introduction and foundation levels of programming.

This proposal takes computational thinking, as described in section 3.4.1, one step further, by addressing conceptualizing and abstraction through programming. This process requires “solving problems and designing systems” (Wing, 2006, as cited by Pinto Llorente, et al., 2017), in this way, this kind of thinking demands a certain amount of algorithmic thinking. According to Valverde Berrocoso et al. (2015), programming is directly related to abstract and mathematical thought and is therefore a “higher-order” thinking skill. However, the necessity of introducing programming in a scaffolded way necessarily establishes the cognitive domain in the “lower-order” thinking skills, as described in DigComp 2.1 by Carretero et al. (2017).

This proposal does not explicitly include curriculum competences for the fourth-grade mathematics class. However, as stated above, programming and problem solving require abstract and mathematical thought.

When developing programming activities in the primary classroom, according to “the intel computer clubhouse network”[9], the objectives are: (1) carrying out activities which motivate the students to work as designers, inventors and creators; (2) motivating students to work on projects based on their own interests; (3) creating a sense of community, where students work together under the guidance of adults; and (4) offer resources and opportunities to those students who do not have access to digital technologies (Valverde Berrocoso et al, 2015, p. 5).

Taking these objectives into account, it can be stated that the teaching of programming aims to turn “passive users” of technology into “active creators”, therefore developing design thinking.

Since this educational proposal includes the direct use of technology in the classroom, specific knowledge and planning is required, because, if technology is simply introduced as a substitute tool, there is no real enhancement of the learning potential through said technological tool. With this in mind, SAMR was developed by Dr. Ruben Puentedura as a descriptive model of the four levels of use of technology by students (Hooker, 2016). The levels are:

[9] For more information on *The Clubhouse Networ*k, visit: https://theclubhousenetwork.org/about/mission/

Table 7. The SAMR Model

	Level	*Definition*	*Example*
Enhancement	Substitution	Technology as a direct substitute, with no functional change	Reading the regular textbooks on tablets
	Augmentation	Technology as a direct substitute, with functional improvement	Using a Dropbox folder or Google Drive to share notes and assignments
	Modification	Technology allows for task redesign	Using interactive games for learning
Transformation	Redefinition	Technology allows for new tasks, which were previously impossible	Using multimedia and online platforms to create animations

Table created by the author and based on the SAMR model as described by Dr Ruben Puentedura

As explained above, scaffolding is very important when teaching, this is particularly true when teaching programming. Firstly, because programming is generally foreign to students and secondly, because "the liking or not of a particular (topic) is based in part on a student's feelings of success (…) based not just on academic achievement but also on experiences in the class" (Hanson, 2001, p. 13). Perceptions of gendered subjects, such as mathematics and other STEM subjects, greatly impact attitudes, participation and achievement, therefore also impacting student success. In other words, girls who perceive STEM subjects as "exclusively male" will have less success in them (Hanson, 2001, p. 13).

As well as that, activities which include STEM topics, such as programming, must be implemented while minding both general socialization, discourse and the hidden curriculum, because the fear and hate of technological and mathematical subjects in women and girls is a learnt response. For example, one study carried out by Cutler-Landsman through the use of LEGO, proved that girls were more involved in activities relating to technology when "they were placed in mixed groups and given the key roles of keyboarder and spokesperson" (Hanson, 2001, p. 14). With this in mind, teachers must be mindful of interactions and expectations in the classroom, as well as equal access to learning experiences. This last point is perhaps the most important, since the most relevant function for Primary Education is to remove barriers in access to learning.

3.4.5. Fifth Year Proposal

Table 8. Competences included in the Netiquette activity

<table>
<tr><th colspan="4">Netiquette</th></tr>
<tr><th colspan="4">Competences</th></tr>
<tr><td rowspan="3">Digital Competence</td><td></td><td rowspan="2">Netiquette
Interacting through digital technologies
Engaging in citizenship through digital technologies</td><td>Competence Level</td></tr>
<tr><td>Communication and collaboration</td><td>Foundation and Intermediate levels 1 through 3</td></tr>
<tr><td>Safety</td><td>Protecting health and well-being
Protecting personal data and privacy</td><td>Foundation levels 1 and 2</td></tr>
<tr><td rowspan="2">Primary Curriculum</td><td>English</td><td colspan="2">Understanding information from recordings in audiovisual formats
Participation in spontaneous and directed conversations
Correct use of punctuation signs
Care in the presentation, creation and organization of texts
Revision and correction of own texts
Affirmative, exclamatory and negative sentences
Expressions of modality
Expressions of manner
Expression of likes and dislikes</td></tr>
<tr><td>Social and Civic Values</td><td colspan="2">Constructing a personal style based on responsibility and personal dignity
Being assertive
Establishing positive interpersonal relations with empathy
Identifying different ways of being and acting
Respecting and accepting individual differences
Value of other people's qualities
Establishing and maintaining friendships, based on the exchange of care and trust
Using positive language for communication during interpersonal relations
Using ICTs through social and civic values in safe environments
Using ICTs in an ethical manner</td></tr>
</table>

Table created by the author and based on the Madrid Primary Curriculum and the DigComp into action user guide.

Netiquette is a word derived from the terms: "etiquette" and "net" and "refers to the do's and don'ts of online communication and embraces both common courtesy and the informal rules of cyberspace" (Buelens et al., 2007, p. 712).

Netiquette, or "digital etiquette" is one of nine elements of digital citizenship, defined as "the ability to participate in society online" (Mossberger et al., 2007, p. 1). According to Ribble (2011, p. 29), "good digital citizens respect others and learn ways to use technology courteously and effectively".

The importance of "netiquette" stems from the fact that new methods of communication are changing the nature of social interactions (Underwood & Farrington-Flint, 2015). These new methods of online communication may be important in the development of new communication styles as well as the promotion of "those higher-order cognitive skills most often associated with learning" (Underwood & Farrington-Flint, 2015, 33).

Obviously, language is a vital part of communication and how meaningful connections are created between people (Underwood & Farrington-Flint, 2015). This makes the language classroom the perfect scenario for teaching communication and communicative etiquette. Furthermore, children start school with a never seen before amount of technological access and experience, which not all parents are able to keep up with, this is most visible in those skills relating to communication and social networking (Revelle, Reardon et al., 2007, as cited in Underwood & Farrington-Flint, 2015). This access and experience drive to an increase in the students' styles of online communication, which are not always the most suitable.

According to the *Autonomous Community of Madrid's Resource Guide for Cyberbullying Cases*, (Subdirección General de Inspección Educativa, 2012) students should be taught ICT good practices and digital literacy, in order to prevent cyberbullying (Luengo Latorre, 2011). This learning should not be limited to the simple use of digital resources, but should extend to "responsible digital citizenship", where students reflect about privacy, as well as critical thinking about what students read and do on-line (Luengo Latorre, 2011, p. 30). This type of prevention is named "primary prevention" and is carried out before there is an incident, it should be implemented in the students' main area of socialization, that is to say, the classroom.

Language learners aim at being successful communicators, therefore they must know the online culture of the second language (L2) they are learning, in order to correctly negotiate meaning (Farshad & Marandi, 2014). However, the results of a 2014 study reveal that EFL learners have a lack of knowledge of netiquette rules and what is worse, do not find them useful. In order to avoid this lack of knowledge, netiquette should be taught explicitly in schools (Shetzer & Warschauer, 2000, as cited by Farshad & Marandi, 2014).

The new London Group (1996), comes to the conclusion that literacy education must consider the great variety of communication that occurs in a globalized world. And in order to consider the vast array of discourses, students need to develop intercultural communicative competence (ICC), because all texts on the web are, in one way or another, culturally grounded (Bryam, 1997).

It is important therefore when teaching children about "netiquette" and on-line social interactions that teachers aim to develop ICC, which will allow students to "negotiate meaning and cultural differences" (Reinders & Thomas, 2010, p. 19). When doing this, Christensen (1993, as cited in Byram, 1997, p. 40) proposes that teachers should not think of ICC as "encounters between different language and culture systems, but rather of encounters between individuals with their own meanings and cultural capital".

All in all, the inclusion of this topic in the EFL classroom responds to the fact that it is one of the tasks of foreign language teachers to grant their students "with the knowledge, attitudes and skills for relating to whatever experience they might have during a period of residence in another country or in an interaction with someone from another country in their own society" (Byram, 1997, p. 39).

The creation of a class contract is based on school democracy and on the idea that "the best way to ensure students act responsibly is to give them responsibility" (Park, 2004, p. 77). Since the students' use of ICTs will not only happen in an educational or classroom context, giving them responsibility over their actions is paramount to them using netiquette throughout their online interactions.

3.4.6. Sixth Year Proposal

Table 9. Competences included in the Fake News activity

<table>
<tr><th colspan="4">Fake News</th></tr>
<tr><th colspan="4">Competences</th></tr>
<tr><td rowspan="3">Digital Competence</td><td></td><td rowspan="2">Browsing, searching and filtering data
Evaluating data, information and digital content
Managing data, information and digital content</td><td>Competence Level</td></tr>
<tr><td>Information and Data Literacy</td><td>Foundation levels 1 and 2</td></tr>
<tr><td>Communication and collaboration</td><td>Engaging in citizenship through digital technologies
Sharing information and content through digital technologies</td><td>Foundation levels 1 and 2</td></tr>
<tr><td></td><td>English</td><td colspan="2">Revision and correction of the students' own texts
Use of ICTs</td></tr>
</table>

Primary Curriculum		Expression of logical connectors Affirmative, exclamatory, interrogatory and negative sentences Expressions of time Expressions of existence Temporal expressions Expressions of manner Understanding oral messages Producing messages with correct pronunciation, accent, tone and rhythm Participation in conversation Understanding diverse texts and their objectives Reading strategies Correct use of punctuation Writing texts using basic connectors Care in the elaboration, presentation and organization of texts
	Social and Civic Values	Expressing opinions, feelings and emotions using verbal and non-verbal language Using listening abilities and thinking in perspective through empathy Using assertive language Dialoguing creating shared thoughts with others in order to create strong arguments Understanding the importance of social responsibility and social justice by using reflection, synthesis and structure
	Spanish	Making direct inferences based on non-explicit information in a text, interprets it and formulates hypotheses about the content Writing texts from different genres, adapting the language to the genre's characteristics, following models and with the objective of developing creative writing abilities Using new technologies to search for information Writing and presenting texts

Table created by the author and based on the Madrid Primary Curriculum and the DigComp into action user guide.

The digital age generates an ever-growing amount of information which is distributed rapidly and is always available. This seems like a great advantage for students today, but learning is not just about information retrieval, even though it is an important element (Spector, 2010). What is more, people are in a constant state of information overload (Wing, 2008, p. 3723), and children are no exception.

In order to sort out through all this information, citizens must have a certain amount of what is known as “media literacy”. Media literacy is, according to the American National Association for Media Literacy Education (n.d.), “the ability to access, analyze, evaluate, create and act using all forms of communication”. News literacy is a subset of media literacy and describes “the literacy that empowers news consumers to determine whether information is reliable and then act on it” (Center for News Literacy, 2016). The importance of this specific kind of literacy relies on the fact that the lack of it leads citizens to believe everything which fits their preconceived notions, which in itself leads to citizens who are disengaged from democracy (Tugend, 2020). Therefore, students should thoroughly reflect on their own role in distributing fake news and how they share on social networks (Mason et al., 2018).

Due to the amount of information and technology children are exposed to from a young age, it would not be much of a leap to infer that they automatically acquire said literacy through observation and use. However, a 2016 investigation by the Stanford History Education Group, proved this is not the case by showing that students ranging from elementary school to college have difficulty both differentiating between ads and news stories and identifying where information comes from. Since people cannot distinguish true from false, disinformation about civic and social problems is allowed to spread and multiply (Donald, 2016).

Media literacy encompasses a huge number of elements, from distinguishing between fake news, satire, reliable news and sponsored news and knowing what a*stroturfing* is, to understanding that not everything on social media is real. In order to work on all elements thoroughly, media literacy should become a main block in the curriculum (Mason et al., 2018), but as stated above, no matter how important, not everything can become a main block of the Primary curriculum, there is neither the time nor the resources.

The number of elements involved in media literacy is due mostly to the overlapping of various other concepts, such as: multiliteracy, news literacy, health and media literacy, digital literacy, coding literacy and media and information literacy (Rasi et al., 2019, p. 2). The introduction of media literacy in schools is extremely challenging, because of the lack of teacher training and how to develop the curriculum in order to help students “become discerning consumers and creators of media” (Mason et al., 2018, p. 9).

The highlight of the sixth-year proposal is the writing of two short news stories. Writing is a process which allows students to specifically “think about language” (Harmer, 2012, p. 218) and, according to Harmer (2012), allows an extra element of motivation, in that students can look at and celebrate their creation. According to Álvarez (2013), writing also gives students tools with which be part of communities, allowing students to unite to other cultures, connect to worldwide collective knowledge, transform individuals’ lives and demystify differences.

Through writing students engage in a means of social participation and become conscious of its importance for democratic citizenship.

This writing proposal is substantiated on "writing across the curriculum" (WAC), which understands writing as a tool for learning, in that it can be used to understand ideas, demonstrate learning, increase thinking, solve problems and live in communities (Álvarez, 2013). WAC is based on four principles (Álvarez, 2013, p. 70): (1) writing and learning are connected, (2) correct writing requires knowledge about discursive conventions and therefore must be practiced in all parts of the curriculum, (3) students are better learners in active settings and learning is a collaborative process, (4) writing is perfected when it is critiqued by equals, revised and rewritten.

3.5. The importance of further activities for learning

According to theories of educational psychology, each student learns in their own way and based on what are known as cognitive or *learning styles*, which define the way in which each person learns (Pertegal & Prados, 2016). Therefore, it is not logical to conclude that one single activity, employing one specific methodology, will be enough for every student to assimilate a specific competence or content.

In this educational proposal special emphasis was placed in proposing activities which include different aspects of the three intelligences described by Sternberg (1997, in Pertegal & Prados, 2016): analytical intelligence, creative intelligence and practical intelligence.

Furthermore, student centered learning states that it is important for "competency-supportive classrooms also require multiple attempts at learning" (Williams, 2009, p. 25), this means that the activities presented in this paper should be complemented with further activities.

Therefore, and in order to include various types of intelligences, it is important to repeat the activities or propose new ones with the same or similar objectives, in order to consolidate learning, and if possible do so throughout all subjects of the Primary Curriculum. It is also fundamental that these activities are varied and include more than one type of intelligence, as well as varying styles of information input, in order to maximize student learning.

When carrying out further activities teachers should be vigilant, especially when using technological and educational applications, since some research suggests that some racial and gender bias exists in the imagery deployed in educational software (Bradshaw, Clegg & Trayburn, 1995; Sheldon, 2004, as cited by Howard et al., 2018). It is important for teachers to be aware of this bias when teaching diverse learners since its existence may interfere with teaching certain basic elements of the primary curriculum, such as equality and non-discrimination.

Another element which must be taken into account is accessibility: new technologies allow students with disabilities to participate in more areas of classroom work than were previously possible but, as stated above, not all educational software is created to be accessible.

4. EDUCATIONAL PROPOSAL

This part of the dissertation aims to describe the activities which are supported by the theoretical framework described above.

Since the mastering of all 21 competences would describe a digitally competent citizen, it seems that mastering all competences would be a very ambitious goal, which is not necessary or appropriate in primary education, since this vastly exceeds the objectives of the stage as described in articles 3 and 4 of the Madrid Primary Education Curriculum. Therefore, only some of the competences are included in the following activities, namely those that are most appropriate.

In addition to the competences exposed, students may develop other competences, because all 21 competences are, in some way or another connected. In this way, depending on the students' individual interests and motivations they may retain certain concepts more strongly than others. For example, programming is inexorably linked to the solution of technical problems, as is protecting personal data and privacy to interacting or sharing through digital technologies. Furthermore, identifying digital competence gaps is a competence which can be developed through nearly any activity relating to technology use.

4.1. The Grinch versus the Robot

The aim of the following activity is for the first-year students to develop computational thinking, as described in the theoretical framework. The activity is carried out with no use of digital technologies and is based on the story "How the Grinch stole Christmas!", by Dr Seuss.

Table 10. CLIL elements included in The Grinch versus the Robot activity

The Grinch versus the Robot		
Content	Knowledge	To know programming requires short and simple instructions
	Skills	To design a clear path through individual movements To learn to describe a way, route or journey
Communication	Language for learning	Language to ask and answer questions Language to give an order Language to ask for attention Classroom language
	Language of learning	Key words and concepts relating to movement
	Language through learning	Language through peer interaction during the game

Cognition	To examine the basic elements inherent to programming
	The students will predict and decide the route necessary for maximum points The students will practice vocabulary and basic sentence structures
Culture	The students will relate The Grinch to Christmas

Because the students are six or seven years old in their first year of school, it seems premature to introduce actual programming. Therefore, following the principles which guide *CS Unplugged*, this proposal centers on basic programming issues without the need for a computer or digital device. These elements will be introduced through the development of basic computational thinking skills as understood under the concept of"pre-programming".

The activity is based on CS Unplugged' "Harold the Robot"[11] activity. However, the students will be working in pairs, with one giving the instructions and the other acting as the "robot", who acts them out, instead of having an adult act as "Harold".

The activity is carried out with no computers or access to digital technologies, but some materials are still needed. First, the teacher will need a "maze", made from 10 or 20 colored mats on A4 sheets. In half of the mats, one side will show a drawing of either a gift or a Grinch. The teacher will also need a "START" and a "FINISH" mat. The last material needed is a stack of 15 small flashcards, 10 with a small drawing of an arrow each, 3 with a signal for jump, 1 "GO" button and finally, one "STOP" button (See Appendix 1).

Firstly, the teacher will have to read the book *How the Grinch stole Christmas*, by Dr Seuss. If the class has the time, they could also watch the Grinch film.

Secondly, the students are placed in pairs. One of the students will act as a robot while the other is a programmer. The teacher must explain that robots can only carry out one simple action at once and that robots will not be able to carry out actions which are too long or complicated. In order for the robot to go through the maze, the programmer will have to place the actions the robot must carry out on the floor with the use of the flashcards. The programmer will have to plan the whole route from beginning to end before the robot may move. The route must always begin with the "START" button and end with the "STOP" button. When the route is planned, the robot is placed on the "START" Mat, and from there the programmer will call out the actions the robot must carry out one by one. While planning the route programmers must be careful not to crash into the Grinch by jumping over him and to try and catch as many gifts as possible, since these will give them points. Because the instructions are complicated and may be hard to understand for a first-year student, the teacher should carry out a mock game after giving the instructions to make sure the students understand what they are asked to do.

[11] For more information on *Harold the Robot*, visit: https://classic.csunplugged.org/harold-the-robot-2/

Sequencing is a basic element of computational thinking and through this activity the first-year programmer will have to visualize, as well as plan the route the robot will have to carry out. Furthermore, both students will train algorithmic thinking, understood as the ability to define clear steps in order to solve a problem. Throughout the process, children must reflect on the spatial dimensions of the plane (forward, backwards, right and left), and make a mental decomposition as well as structure movement (learning to dissociate the idea of turning and displacement, for example). The activity therefore provides students with the opportunity to convert abstract actions into concrete and physical movements, in this way students will develop computational thinking while being involved in an engaging and meaningful context.

The potential benefits of the activity are the development of logical thinking skills, oral English skills, mental structuring, as well as the training of gross motor skills. During this activity, students also work on spatial structures and sequences which provide a mathematical background. This design offers an added value in relation to other digital technologies: sequence cards will help the students visualize each of the movements without getting lost, as well as allowing them to identify the error and rectify it more easily when the result is not as expected. Moreover, this activity is based on the symbol-and methodology of Bee-Bots, which provides a framework for their introduction later on if needed.

This activity could, and should, be complemented with further work. One possibility is asking the students to carry out an *Hour of Code*, in the following years, for example *The Grinch Hour of Code*[12], where the students are asked to carry out the very same activity but through coding blocks.

In order to further complement this activity, the teacher could ask the students to create the materials needed for the game, this reinforces the idea that children learn by doing. According to Wright (2001, p. 5), arts and crafts are “particularly important at the lower levels because they make a child’s limited range of language part of something bigger”, therefore, through the creation of the materials, the activity is individualized, creating an extra level of motivation for the students.

[12] For further information on *The Grinch Hour of Code*, visit: http://grinchhourofcode.com/game.html

4.2. Digital Picture Books

For second-grade students, this paper proposes the creation and publishing of a digital picture book, based on vocabulary relating to animals and descriptions.

Table 11. CLIL elements included in the Digital Picture Books activity

Digital Picture Books		
Content	Knowledge	To know how to create and share a digital story
	Skills	To create a short digital story To train the building of simple sentences
Communication	Language for learning	Language to ask and answer questions Classroom language Language for effective pair work Language for simple debating
	Language of learning	Key words and concepts relating to animals Language relating to descriptions (colors, shapes, positions)
	Language through learning	Language through peer interaction Language from manipulating the web page
Cognition	To recognize the structure of basic sentences To understand new vocabulary and sentence structures To know that the internet is a creative vehicle	
Culture	To understand others' point of view by realizing simple creative elements lead to distinct and individual creations	

This activity is carried out on the free platform *Culture Street*[13]. It is simple to use, due to a limit in creative options. The simple, user-friendly format of the platform is particularly fitting for the second-year age group, since it offers enough creative liberty for the students to be able to create a fulfilling book, while not being so difficult that the creative process would be insurmountable.

In this case, and since the students will have only been learning English for one year and still have issues with writing, the activity will not include the creation of a story, in the classic sense of a picture book. Rather, the students are asked to create a picture book based on model sentences, and using sentence stems, for describing an animal and are based on the syntactic-discursive elements described for this grade in the curriculum. The model sentences are: This is a___. It lives in the___. It has got/hasn't got___. It can/can't___. It likes/doesn't like___. The materials required for this activity are simply computers, or iPads with internet access.

Firstly, the students are shown a model book made by the teacher. Secondly, he or she explains that the students will also be creating a short book in pairs, which will include all the

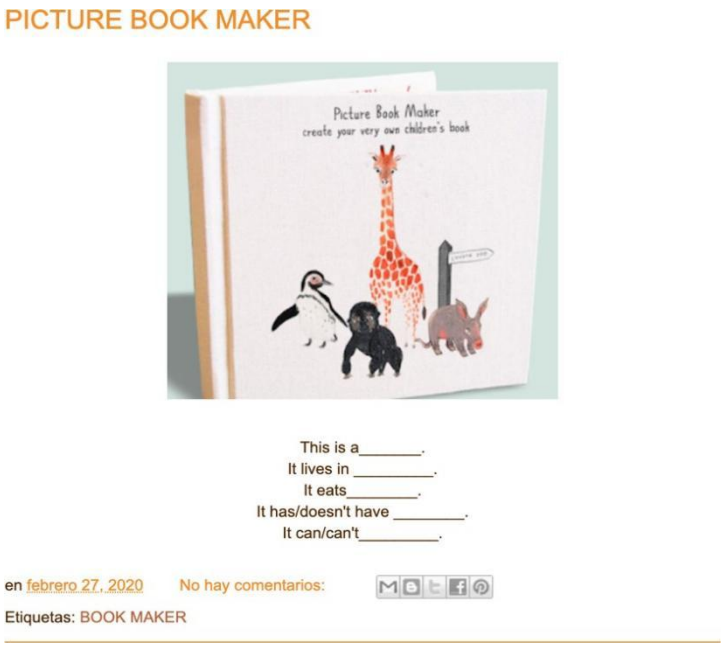
[13] For further information on *Culture Street*, visit: https://www.culturestreet.org.uk/activities/picturebookmaker/index.php?id=3

relevant information the students know about a given animal. Thirdly, they are shown how the website is used (how to add a background, text, a character, an object…). During the creation of the books, the students are allowed to ask questions in order to make the process as interactive and formative as possible.

One of the benefits of this activity is that it is cross-curricular, since one of the topics discussed in the second-grade natural science class is the animal kingdom, including the general characteristics of animals and their feeding habits. It also includes elements of the artistic education curriculum, namely the use of ICTs for the creation of images and the use of simple computer programs for elaborating and editing digital images, which can be used as an illustration for work with texts (Consejería de Educación, Juventud y Deporte, 2014).

This activity was carried out by a class of second year students at *CEIP Ortega y Gasset*, in Madrid, in February 2020. These students had no experience creating digital stories or picture books and were given one hour to explore and write them. The activity allowed students to be fully immersed in their activity (they frequently referred to the activities as a “game”), as well as spiking their curiosity.

Image 3. Model offered to the students on the class blog



Though the students were asked to create the story following the model given, many of them took the activity further and created full picture book stories, with a clear beginning, middle and end (See Appendix 2).

Therefore, the activity does not have to be this strict and could be adapted to create stories, even with a storyboard. If this is the case, due to the nature of the activity and owing to the

concession of creative liberties, nearly any of the syntactic and discursive contents designated in the primary curriculum for the second year may be used by the students or modelled by the teacher.

As a way to expand on this activity, teachers may also organize a small comic creating workshop, by using another Culture Street resource: the *Super Action Comic Maker*[14], where students are asked to create a comic and may practice using action words or creating dialogue.

4.3. Music Game Padlet

For third-grade students, this paper proposes the search, evaluation and compilation of games relating to music.

Table 12. CLIL elements included in the Music Padlet activity

Music Game Padlet		
Content	Knowledge	To know what key words are To recognize a safe website for the search of information To understand information can be shared collaboratively on-line
	Skills	To search for specific information on the web To distinguish advertisements from websites
Communication	Language for learning	Language to ask and answer questions Classroom language Language for effective group work
	Language of learning	Key words relating to music Key words relating to games
	Language through learning	Language through peer interaction Language through the internet search Language through the use of Padlet Language through the trying of the games
Cognition	To know that the internet is a tool for the search of information The students will have to decide as a group	
Culture	Names of instruments Classification of instruments	

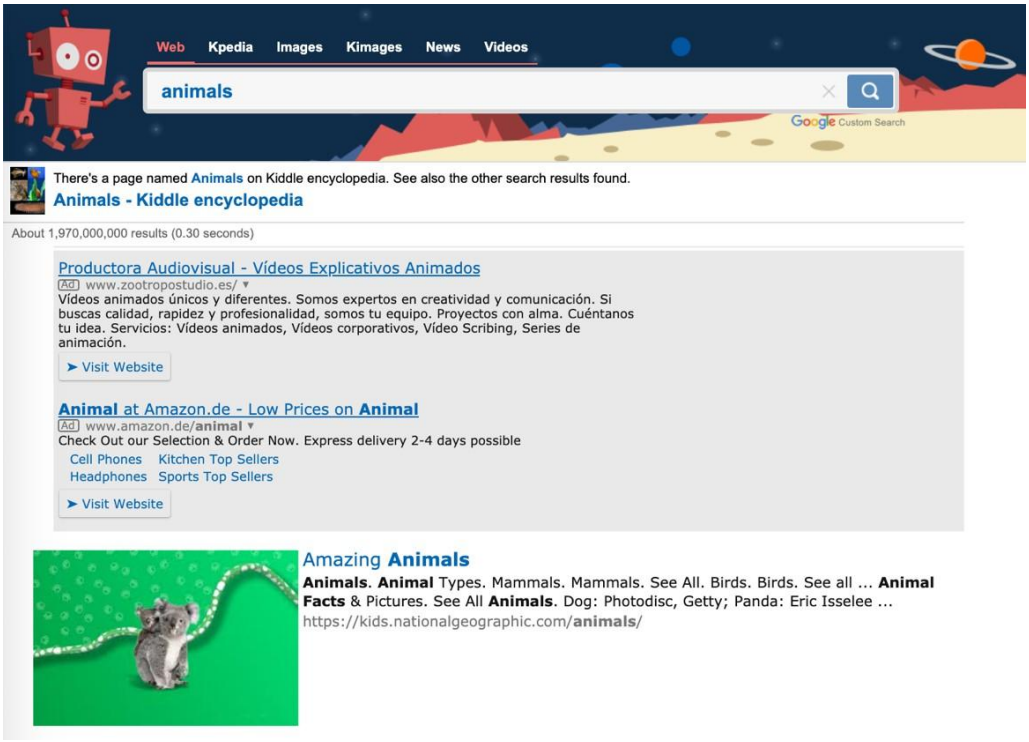
Firstly, the students are shown the search engine *Kiddle*, projected on a Smart Board. They are asked if they know how to search for specific things online. The objective is for the students to understand that, logically, certain words bring up certain results and that introducing the right key words will increase the chances of finding what a person is looking for.

When the students have understood how to correctly use a search engine, they are asked to search for games relating to music. The teacher must make sure to encourage the students to try the games in order to decide, as a group, which game is their favorite.

[14] For further information on S*uper Action Comic Maker, visit:* https://www.culturestreet.org.uk/activities/superactioncomicmaker/index.php?id=2

Students are growing up in a highly digitalized world and that they need to learn strategies to cope with living in a knowledge and communication society. However, learning to search for information must be done in an unhurried manner, slowly introducing access to more information. With this in mind, the students will use Kiddle, instead of Google. This way, the search results are reduced, and the teacher still retains a small amount of control over what the students search and find. That being said, the search engine still shows advertisements, which are clearly distinguishable, since they appear in a grey case under the search box.

Image 4. Kiddle search results and Advertisements



It is very important that the teacher makes sure the students understand the difference between an advertisement and a search result, in order to push the students to think critically and analyze on-line content.

As expressed in section 3.4.3, by Hein (2014), *edutainment* is not specifically more or less effective than traditional learning methods. However, including these kinds of games instead of commercial ones suits the purposes of the targeted DigComp competences better, since commercial games are not usually readily available and open for any internet user to play.

Once the groups have chosen their favorite game, they are asked to write the key words used to find it in a class Padlet, with a link to the game, as well as a short description of why they like and chose this game over the rest that they found. They create this text by using model sentences, like: We like this game because___. This game is fun because___. This is our favorite because___. As well as a list of key vocabulary, such as: fast, fun, instruments, games, colors.

Since the students are free to choose whatever games they find most appealing, the music competences worked on in these games will not be up to the teacher. As a matter of fact, according to Hein (2014), most mainstream music games center around rhythm, making this aspect of the Primary Curriculum most probable for the students to find.

However, this does not mean that the teacher retains no control over what is included in the final Padlet. In fact, it is very advisable that the teacher includes further games and resources which focus on those aspects of the music curriculum that the students have not included in their chosen games, such as composition through *Bandemonium*[15] or the English names of musical instruments[16].

4.4. Scratch

This TFG proposes an introduction to programming for the fourth-grade students. In order to achieve this the students will create an adventure game through the block programming system Scratch.

Table 13. CLIL elements included in the Scratch activity

Scratch		
Content	Knowledge	To know a website which introduces programming projects
	Skills	To create a simple game through block programming
Communication	Language for learning	Language to understand instructions Classroom language
	Language of learning	Key words relating to code Key words relating to programming blocks
	Language through learning	Language through the use of Scratch
Cognition	To understand programming requires an organized set of instructions To know the internet is a creative vehicle	
Culture	Cartoon Network characters	

Due to the fact this activity is guided through a Scratch website tutorial, the teachers function is to simply act as a guide and help when needed. That said, it is advisable that the teacher takes a short amount of time at the beginning of the class to explain what coding is, what the objective of the activity is and what platform the students will be using, in order to increase motivation.

This activity is especially student-centered and allows for students to decide the speed at which they want to carry out the tutorial. Furthermore, said tutorial includes further elements and

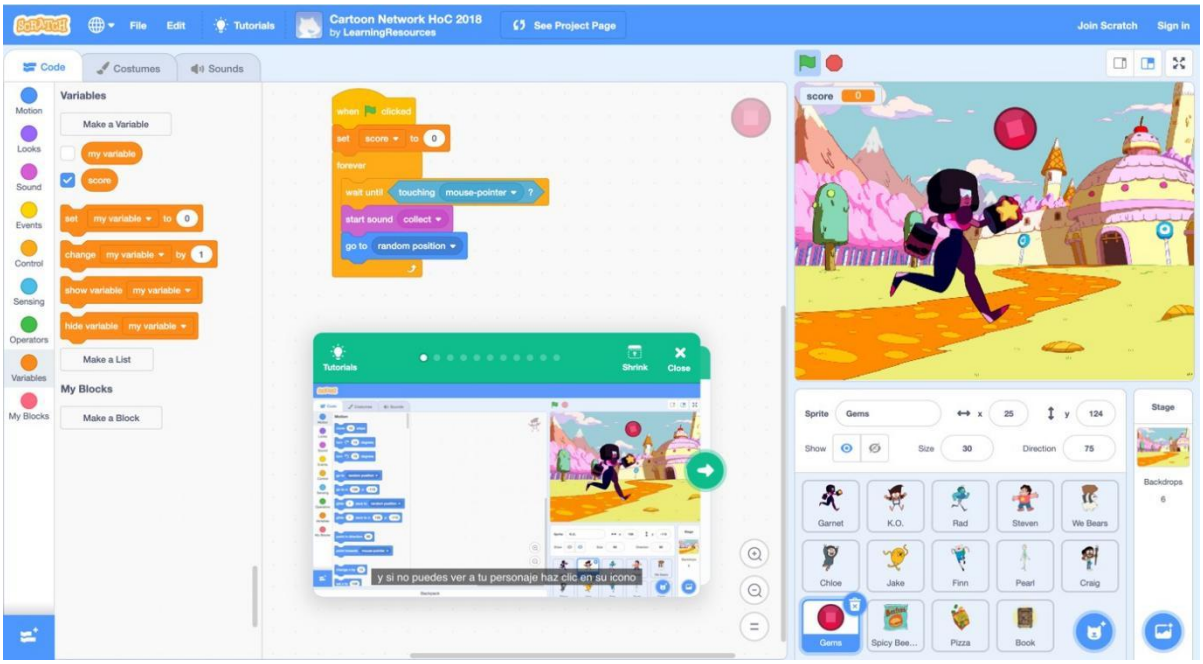
[15] For further information on *Bandemonium*, visit: https://www.abcya.com/games/bandemonium

[16] For further information on M*usical Instruments 1*, visit: https://learnenglishkids.britishcouncil.org/word-games/musical-instruments-1

activities for fast finishers, such as adding blocks, changing the backdrop or adding new sprites.

According to the Intel Computer Clubhouse Network, referenced in section 3.4.4, the key when carrying out programming activities in the primary classroom is increasing motivation, while offering equal coding opportunities to all students. With this in mind, this activity aims to shock the students into realizing that, as Picasso said, "*everything you can imagine is real*".

Image 5. Scratch block programming system and Adventure Game Tutorial



As can be seen in the image above, the tutorial includes Spanish subtitles, though the instructions are given in English, with visual aids throughout, in order to locate and use the blocks. The tutorials offered on Scratch are especially convenient for EFL learners, since the students may choose when they are ready to continue with further instructions. Other systems, such as Code with Google, Hour of Code or Blockly, do not include some or all of these elements, making them less comprehensive and, therefore, less fit for EFL learners.

Once the students have been introduced to Scratch through the creation of the adventure game, it is important that they continue learning. One way to ensure this, while still working in EFL, is to ask the students to follow another Scratch tutorial, namely *Code a Cartoon*[17]. This tutorial allows for the creation of an animated story and could completely turn students into "active creators" of media they consume. However, creating a story, as described in section 4.2, requires the creation of a storyboard and, though the students follow certain steps, calls for a certain "blank slate". If a parallel is established to the "blank canvas" in traditional music

[17] For further information on *Code a Cartoon*, visit: https://scratch.mit.edu/projects/331474033/editor?tutorial=code-cartoon

creation software (Ruthmann, 2012, as cited by Hein, 2014), it may be intimidating for a beginner to have to both create a full story and find the programming blocks to create it. Furthermore, the creation of a cartoon usually requires more than one character, which depends upon the programming of more than one sprite, greatly increasing the difficulty. Therefore, though all tutorials are made for beginners, some are more suitable for complete beginners than others.

4.5. Netiquette

The following set of activities is aimed at fifth-grade students and explores the rules of netiquette through debates and the creation of a "virtual class contract". The complexity of the topic favors that these activities be carried out over several sessions.

Table 14. CLIL elements included in the Netiquette activity

Netiquette		
Content	Knowledge	To know what appropriate on-line etiquette is
	Skills	To create a class contract
Communication	Language for learning	Language for discussions Language to ask and answer questions Classroom language
	Language of learning	Language relating to communication Language relating to netiquette
	Language through learning	Language through debating
Cognition	To develop intercultural communicative competence	
Culture	To understand how on-line writing affects tone	

Firstly, the students' attention is grabbed by engaging them in a class debate, in which the teacher asks open-ended questions, such as: are there jokes you do not like your friends telling? are some things people say or do hurtful? The objective is for the students to recognize that there are limits to what one can say or do. In order to make this activity more accessible, it would be helpful to display guidelines for debate language, such as how to express an opinion, how to disagree or how to report other students' ideas (Appendix 4).

Secondly, since the students are EFL students, they must be introduced to basic language relating to netiquette, since this term is not everyday vocabulary. In order to achieve this first introduction, the students will be asked to watch a video on the *Brainpop* website, named *Digital Etiquette*[18]. It is advisable that the closed caption be turned on for the video in order to aid students in understanding. After solving any possible doubts, the teacher asks the students to relate what they saw in the video to what they debated about earlier.

[18] For further information on the *Digital Etiquette* video, visit: https://www.brainpop.com/technology/digitalcitizenship/digitaletiquette/

Thirdly, the students are asked to debate in groups of three or four about ways in which people ignore others limits online, while including real life examples. If the students are stuck the teacher may guide the groups by asking further open-ended questions, such as those proposed by the Danish Center for Digital Learning[19]: where are your limits for pictures others take of you? Are there situations where you do not want a picture to be taken of you? Where is your limit on what people write about you? Is there the same limit for what you write about others? Did you realize that there are other students with different limits to you? What are they?.

When the students have finished debating, the teacher asks the students to tell the rest of the class their conclusions and writes the information in a mind map on the board.

After this, the students are asked if face to face communication is any different from on-line communication (does the person reading the message have cues from your tone of voice or facial expression? do upper- and lower-case letters change a message?). The teacher must try to gently guide the students to develop the most common issues with on-line communication, while remembering to make an emphasis on privacy and the permanence of what is posted on the internet.

With the information on the board, the students are asked to brainstorm the rules one must follow in order to follow what we have learnt is *Netiquette*. With these rules the class will, democratically, create a "virtual class contract". This contract will later be presented in the school website and will serve as a guideline for all actors in the school community. The creation of these contracts is especially relevant when teachers use on-line learning communities, such as: Classcraft, Blogspot, Wix, Google Classroom or even Twitter.

Depending on the schools' resources, the students create the contract on paper as a collage and take a picture or go a step further and create the contract on paint, word, power point or even adobe.

Due to the enormity and importance of this topic and its effects on cyberbullying it could be developed further into a cross-curricular project, by diving the class into small groups and asking the students to create videos, where each group will present one rule which must be taken into account when interacting on-line. This production would require the creation of storyboards and important creative decisions, ranging from the choice of imagery to music, these decisions also require a conversation about copyright. As well as the possibility of using, for example stop motion as opposed to the students' own image, which requires reflecting about privacy and on-line content.

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[19] For further information on *Elvens digitale kompetencehjul*, visit: https://elev.digitalekompetencer.dk/

4.6. Fake News

The following proposal is loosely based on the one published by Ferlazzo (2017) and asks students to reflect on the importance of reliable information.

Table 15. CLIL elements included in the Fake News activity

Fake News		
Content	Knowledge	To understand the importance of reliable information To remember what fake news is
	Skills	To distinguish fake and real news To create news stories
Communication	Language for learning	Classroom language Language to ask and answer questions Language for class discussions Language for effective group work
	Language of learning	Language relating to text genres Language relating to news (fake, real, satire)
	Language through learning	Language through peer interaction Language from writing news stories Language learnt from reading news stories
Cognition	To understand that not all news sources are reliable To recognize that the internet can be used to find good information if one knows where to look	
Culture	News stories	

Firstly, the students are asked to debate in pairs if it is important to keep up with the news and write down their ideas. Then, they are asked for their answers and the teacher writes down their ideas on the board in the shape of a T-Chart. It is very important here for the teacher to allow students to describe any reasons they might think of. For example: if their reason for not reading the news is “it is boring”, this is as much a relevant argument as any other. If students are coerced into only saying what they think the teacher wants them to say then the activity is not personalized and, ultimately, futile.

The use of a visual organizer, such as a T-Chart is very important, since it allows for all students to keep up with what is being said, even if they have difficulty following what they are listening. It also allows the teacher to present any new vocabulary which may arise in written and oral form, making its assimilation easier. Moreover, visual learners may profit from the writing down of all relevant information.

Secondly, the teacher must place four pieces of paper in the four corners of the classroom with examples of information sources written on them: social media, television or radio, written news and friends or family. Then the teacher explains that information can arrive from many different sources and asks the students to place themselves in the corner where they receive the most amount of information. The teacher must make sure to allow the students some time

to think and clarify any possible questions about the categories. When the students have chosen their corner, the teacher asks them which source they think is most reliable.

Thirdly, the students are asked if they have heard the term “fake news”. If they have, they are asked to elaborate, if not, the teacher will explain that fake news is “made-up (information) with an intention to deceive, often in order to receive clicks”. It is important that the teacher offers strong scaffolding and makes sure the students fully understand the concept. When the students have understood the term the teacher opens a discussion around the question: why do we care if we can tell real news from fake news?

After this short debate the teacher explains that there is a simple way to tell fake news from real information, through the use of a series of markers, which act as a guideline for the analysis of news stories. The teacher must allow students to share their own ideas for questions or cues which may help distinguish real and fake information. Once thy have shared their ideas, the students are introduced to the news test list (See Appendix 3).

Once the students have read the list, they are divided into groups. Each group is handed a news story and the students must try to determine if the news story is real or not as well as explain why. Ideally the news stories used should be current and must be at an appropriate level of English so the students may understand them. Some websites which offer current news stories for English learners are: learning English by Voa news[20], News in Levels[21] or Young Zine[22]. Another option for teachers is adapting authentic news stories to the students’ level: by paraphrasing or eliminating unnecessary detail but they must always make sure to include content-obligatory language (Harmer, 2012). It is important in the duration of this activity for the teacher to also point out that the internet is a tool, which provides access to a lot of knowledge, some of which is reliable (Jackson & Jamieson, 2007, p. 118).

Finally, students are asked, in pairs, to write two versions of a story, one fake and one real one and challenge their classmates on which one is which. In order to do this, it is very important that students know how a news story is written, meaning they should have a clear idea not only of the elements they should include in the fake and real news story, but also how news stories are generally built. Though they learn this in the Spanish language class, it would be wise to remind them. When carrying out this writing activity students should be encouraged to follow a writing method: planning, writing and revising (Álvarez, 2013).

In order to share the stories, the teacher could use different mediums, depending on the resources available: the students could create small posters, write their stories in a shared

[20] For further information on *Learning English*, visit: https://learningenglish.voanews.com/
[21] For further information on *News in Levels*, visit: https://www.newsinlevels.com/
[22] For further information on *Youngzine*, visit: https://youngzine.org/

Google Drive or Padlet or students could even be asked to add their stories to a Wix page. Due to the fact that this is clear student-driven work, it could be part of a writing portfolio, online or off, in which students show their work and progress.

4.7. Assessment, evaluation and feedback

Evaluation, feedback and assessment have been used as interchangeable terms, and though they are similar, they are also distinctive. For the interests of this paper these terms will be defined in the following manner:

Feedback is "information provided by an agent about aspects of a performance or understanding", it is therefore understood here as a direct consequence of performance (Hattie, 2010, p. 174). Generally, feedback will flow from teacher to student during the production process, in this way "feedback" is information which can confirm, overwrite, add to or restructure information in memory, it is fundamentally formative. Feedback cannot be positioned in a secondary role (Gregori-Signes, 2014) and must be carried out during the activities in this paper, because they are student-centered and interactive.

Assessment refers to the gathering of information relating to a student's learning. In the context of this paper, assessment refers to classroom research and generally flows form student to teacher in order to understand what, how much and how well students are learning. In this way, "assessment" is also fundamentally formative, as it helps the teacher improve their practice and strategies and is principally directed to improving student learning.

An evaluation is a process of gathering of information relating to a process or procedure of learning. It is product-oriented and is established as a final review of a product in order to determine its quality.

All assessment of learning can be divided into two main blocks: summative or formative assessment. The former describes the evaluation of learners' skills at one specific point in time, while the latter aims to locate student needs in order to plan further learning (Coyle et al., 2010). Therefore, and for the sake of this paper, feedback and assessment are formative, while evaluation is summative.

4.7.1. Assessment of learning

CLIL is a specific teaching methodology and therefore, has its own specifications relating to assessment. When evaluating in the context of a CLIL methodology, it is important to remember certain key principles (Coyle et al., 2012): (1) clear learning objectives, (2) mixture of formal and informal assessment, (3) familiarization of learners with assessment techniques, (4) assessment of content knowledge with the simplest form of language possible, (5) assessment of language for real purposes and in real contexts, (6) student responsibility for assessment.

However, according to Harmer (2012), the first question a teacher must ask themselves is: am I assessing content, language or both? Only after answering this question, can teachers begin to decide *how* to evaluate.

4.7.1.1. Assessment and evaluation of language

The language learnt and produced in the proposed activities can be assessed on the basis of the curriculum competences through teacher observation and note-taking. Evaluation, or summative assessment, of the students' language competences can also be carried out through the taking of standard primary examinations, since the evaluated competences will be the same as those taught in the "regular" EFL Primary Curriculum.

4.7.1.2. Assessment of content

Assessment of digital competence is fundamentally formative, because digital competence is part of life-long learning. It is no surprise that one of the competences included in the "problem-solving" area of DigComp reads "identifying digital competence gaps". This competence clearly establishes "self-evaluation" in the forefront. However, this does not mean that assessment is equal for all competences and throughout all proficiency levels. According to Anderson et al. (2001, p. 8), "objectives in different (proficiency levels) require different approaches to assessment", because they require specific cognitive domains. In the case of the activities presented in this paper, assessment should mainly center around remembering and understanding, since these are the cognitive domains which correspond to the foundation and intermediate levels.

4.7.2. Assessment of teaching

Teacher self-assessment and critical reflection on teaching practices is very important in order to "improve and develop the quality of (…) teaching" (Dymoke & Harrison, 2008 and Pollard et al., 2008 as cited by Kyriacou, 2009, p. 151).

In order carry out said self-evaluation, teachers may use a simple questionnaire checklist, such as the one created by Kyriacou (1991, p. 126, as cited in Dean, 1999, p. 155):

- Did this lesson go well? Were the activities successfully implemented? What did the students learn in the lesson? Did the lesson reflect my intended aims? Did the lesson catch and sustain the pupils' attention and interest? Did any problems happen in the lesson which I should take care of?
- Did any pupil or group of pupils fail to benefit? Could this have been avoided?
- What changes can I make before giving a similar lesson again?

- What have I learnt about this class which could influence further lessons?
- What have I learnt about this topic which could influence future lessons?
- Are there any actions I should take following this lesson?
- How can I consolidate the learning and relate it to future demands and applications?

In conclusion, whatever the mode for evaluation may be, teachers must be mindful of collecting data about teaching practice in a systematic and cohesive manner.

5. CRITICAL REFLECTION

5.1. Level of fulfillment of the objectives and competences

The general objectives described in section 2.1 were completed, since many of the competences acquired in the teaching degree were integrated in the creation of the proposals presented. Furthermore, varied didactic strategies were employed when developing the proposals. Mostly, ICTs relevant to the teaching profession were tested and used.

In relation to the specific objectives, described in section 2.2, this paper describes why digital competence is important as well as why it should be developed in schools and continues proposing six activities in which students train digital competence while learning English in a natural environment.

In relation to the degree competences, this paper includes all but one of them, the one relating to social science (CG 8.2). Some of these competences are developed in more study than others and all can be observed in further detail in section 5.4.

5.2. Limitations of the study and future directions

This paper has required an amount of work and dedication which primary teaching students are not asked to undertake in any other aspect of their training. This is mainly due to the fact that Digital Competence is not taught in regular teacher training, however it is notable that even with all the requirements and the notable importance of this paper, it is only worth 6 credits, an amount which seems to underestimate the number of hours needed for its elaboration.

After finishing this paper, several limitations and possibilities for future work have been detected. The limitations detected are a lack of universality in the proposals, the fact that they only take place in the production stage of language learning and the importance of further developing the competences in the competence area of safety; while the possibilities for future work are the great potential for application of programming in Primary Education, and the opportunity entailed by importance of the development of teacher digital competence.

Firstly, the activities expressed in this dissertation are designed for a very specific context, that of Primary Schools in the Autonomous Community of Madrid. Therefore, they are not

generalizable to every educational context in every part of the world, this is especially true and relevant for women's access to science and technological education, which are greatly dependent on narratives, socialization and politics. In this way, the design of learning experiences must be carried out by challenging ideas of the masculinity of STEM fields, while relating to local and cultural contexts. Furthermore, access to resources is not homogeneous between countries, municipalities, schools or students. According to the United Nations, an alarming 46,1% of schools in Spain are segregated (Alston, 2020). This is especially true of Madrid, where ghettoization of schools has led to grave issues of inequality of opportunities and education. Though most of the proposals in this dissertation do not require extensive and expensive materials, it is debatable if the highly specialized levels of digital competence can be achieved with a lack of resources and training.

Secondly, all the activities presented in this dissertation take place in the production stage of language learning, due to the fact that language is used as a vehicle in order to learn digital competence and not the other way around. Therefore, it remains to be seen how digital competence can be taught in the presentation and practice stages of instruction.

Thirdly, as stated in section 3.1.2, due to an ever-increasing number of instances of cybercrime as well as time of use of ICTs and an ever-increasing amount of electronic waste, the competence area of safety becomes especially important. This paper addresses them but not in a cross-curricular, complete way. It is the author's opinion that further research and work is needed in order to develop further activities which directly address digital safety in EFL learning.

In fourth place, programming platforms, such as Scratch, Blockly, Hour of Code or MicroBit could be applied much more broadly in Primary Education, in order to promote digital competence. One could assume that the use of these platforms only promotes programming, but that is not the case. All of these systems congregate vast communities of users who share their projects and exchange information on secure platforms. As a result, a student who is motivated to program on Scratch will, in the end, train all 5 competence areas.

Finally, all of the competences expressed in this paper cannot be achieved if teachers are firstly, not knowledgeable and secondly, not specifically trained in digital competence. As stated at the beginning of this section, teachers in training do not receive specific classes relating to ICTs, digital technology, design of online learning spaces and activities, ethics in the use of ICTs or tools for online learning. All of this learning is relegated to master's degrees, optative or online courses, which may not be accessible to all students in teacher training. This lack of access may ultimately result in a lack of innovation, curiosity and motivation towards education with, through and for technology. Certainly, the establishment of a specific and

mandatory subject for the use of ICTs in teaching is a much debated and complex one, which greatly exceeds the purposes of this dissertation. However, it would be worth reflecting on the possibility of including these elements in a cross-curricular fashion.

5.3. Conclusions and personal reflection

The fundamental aim of this dissertation was to compile and report information that can contribute to motivating fellow teachers to apply elements of digital competence in their work and to prove that the teaching of digital competence does not necessarily require extensive knowledge of technology, but rather a willingness to learn and try new things.

This TFG proposes six activities which aim to promote the introductory elements of digital competence through the learning of English as a foreign language. Nevertheless, they are not fixed in stone and are open to change in order to be most effective and address the needs of one or another class group.

Throughout the writing of this dissertation I have come into contact with many resources, such as "Happy on Life[23]", a game created by the EU in order to teach students about the risks and benefits of internet use; or LEGO Mindstorms, a platform to learn programming. Additionally, I have been able to research multiple teaching methodologies, for English language teaching, for the teaching of digital competence and for teaching through ICTs. The inquiry of this topic has brought to light that the use of ICTs for teaching is still an emerging area of knowledge, in which I would like to delve much further, especially in the design of learning materials.

All in all, the writing of this dissertation has been a difficult journey, but a very rewarding one. Through it I have grown as a professional, learning more not only about digital competence, but about teaching methodology, ICT resources and lines of research relating to their use. Moreover, I have been able to establish important connections between the competences I have developed during my teacher training.

5.4. Linking of the degree competencies within the dissertation

Table 16.Visibility of the degree competencies within the dissertation

General degree competencies:	Section in the TFG:	References-information sources	
		Primary sources	Secondary sources
CG1. To understand the evolutionary process in the biological and psychological development of children between the ages of 6 and 12.	3.3.2 3.3.4 3.4.1 3.4.3	Muñoz Tinoco et al. (2014), 16 Perinat Maceres (2014), 17 Piaget (1973), 21 Ridao Ramírez & López Verdugo (2014), 21	

[23] For further information on *Happy on life*, visit: https://web.jrc.ec.europa.eu/happyonlife/

		Barudy & Dantagnan (2005), 24	
CG2. To understand the processes of learning in children between 6 and 12 years old.	3.1.4 3.3.2 3.3.3 3.4.1 3.4.5 3.5	Bloom (1956), 13 Vygotsky (1970), 16 Marchesi et al. (2018), 16 Vygotsky (1979), 16 Castejón et al. (2013), 17 Barr & Stephenson (2011), 20 Asher (2012), 21 Ridao Ramírez & López Verdugo (2014), 21 Park (2004), 30 Pertegal & Prados (2016), 33	Sternberg (1997), 33
CG3. To know the foundations, principles and characteristics of Primary Education	3.1.1 3.1.2 3.4.5	Bax (2020), 9 Tenorth (2013), 9 Consejería de Educación, Juventud y Deporte (2014), 10, 22, 23, 25, 28, 38 Luengo Latorre (2011), 29	
CG4. To design, plan and evaluate learning and teaching processes in the context of the school as an educational institution.	1 3.1.3 3.1.4 3.3.1 3.3.2 3.3.4	Barr & Stephenson (2011), 6, 7 Kluzer & Rissola (2015), 12 Carretero et al. (2017), 13 Kluzer & Pujol (2018), 13 Harmer (2012), 14 Spector (2010), 16 Iglesias Muñiz (2017), 17	
CG5. To analyze the importance of social factors and their influence on educational processes.	1 3.1.2 3.2 3.4.1 3.4.4 3.4.5	Instituto Nacional de Estadística (2019), 5 Ministerio de educación y formación professional (2018), 5 Wing (2008), 6 Monereo & Pozo (2010), 6 Ministerio de ciencia, innovación y universidades (2019), 6 Monereo & Pozo (2010), 10 Castells (2001), 10 UNICEF (2018), 11 Ferreira & Díaz Velázquez (2009), 11 Burke et al. (2016), 14 Bacher (2012), 21 Hanson (2001), 27 Underwood & Farrington-Flint (2015), 29	Revelle, Reardon et al. (2007), 29 Shetzer & Warschauer (2000), 29 American National Association for Media Literacy Education (n.d.), 32
CG6. To know and apply techniques for the gathering of data through observation or other strategies in the processes of investigation, evaluation and innovation.	3.4.2 4.7	Gregori-Signes (2014), 23 Hattie (2010), 47 Gregori-Signes (2014), 47 Coyle et al. (2010), 47 Harmer (2012), 48 Anderson et al. (2001), 48	Dymoke & Harrison (2008), 48 Pollard et al. (2008), 48 Kyriacou (1991), 48
CG7. To understand tutorial action and orientation in the frame of education, students and developmental contexts.	3.4.5 3.4.6	Buelens et al. (2007), 28 Mossberger et al. (2007), 29 Mason et al. (2018), 32	
CG8.1. To design didactical strategies appropriate to the nature	4.2	Consejería de Educación, Juventud y Deporte, 2014, 38	

of the specific field, starting from the Primary curriculum, for the area of natural sciences.			
CG8.2. To design didactical strategies appropriate to the nature of the specific field, starting from the Primary curriculum, for the area of social sciences.			
CG8.3. To design didactical strategies appropriate to the nature of the specific field, starting from the Primary curriculum, for the area of mathematics.	3.4.4	Valverde Berrocoso et al. (2015), 26	
CG8.4. To design didactical strategies appropriate to the nature of the specific field, starting from the Primary curriculum, for the area of language and literature.	3.2 3.3.1 3.3.3 3.4.1 3.4.2 3.4.5 3.4.6 4.4	Coyle et al. (2010), 14, 15 Reynolds (2015), 14, 15 Harmer (2012), 17, 32, 46 Asher (2012), 21 Wright (1990), 22 Farshad & Marandi (2014), 29 The new London Group (1996), 30 Bryam (1997), 30 Álvarez (2013), 32, 33, 46	The International Reading Association (2001), 14 Christensen (1993), 30
CG8.5. To design didactical strategies appropriate to the nature of the specific field, starting from the Primary curriculum, for the area of music.	3.4.3 4.4	Hein (2014), 24, 40, 41	Gee (2007), 24 Green (2002), 24 Ruthmann (2012), 43
CG8.6. To design didactical strategies appropriate to the nature of the specific field, starting from the Primary curriculum, for the area of arts and crafts.	3.4.2	Lightfoot (n.d.), 22 Eisner (2002), 23	
CG8.7. To design didactical strategies appropriate to the nature of the specific field, starting from the Primary curriculum, for the area of physical education.	3.4.1	Bacher, 2012, 21	

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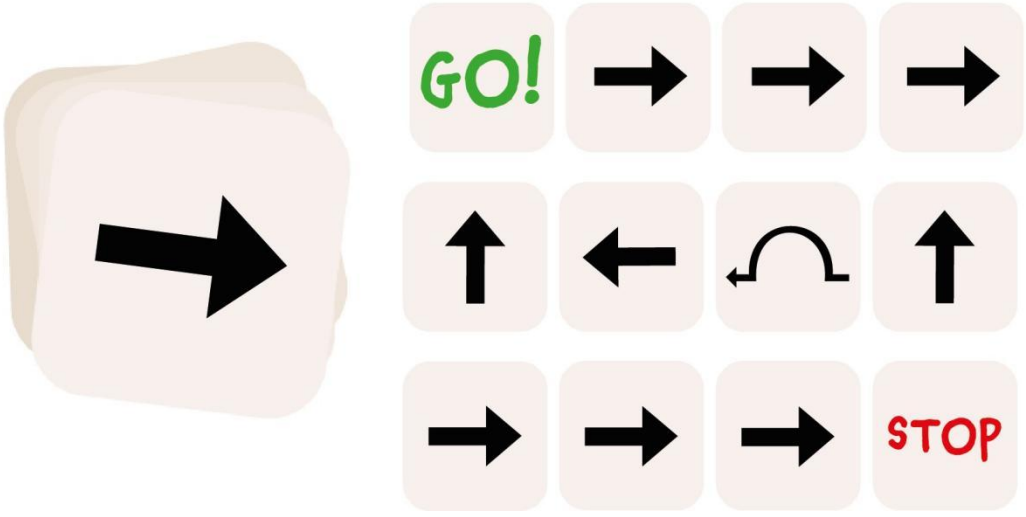
7. INDEXES

7.1. Table index

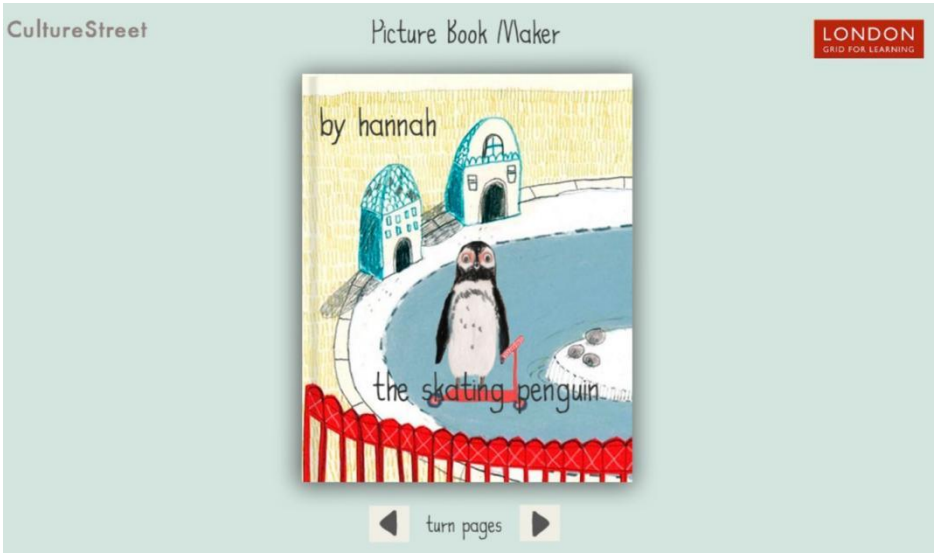
7.2. Illustration index

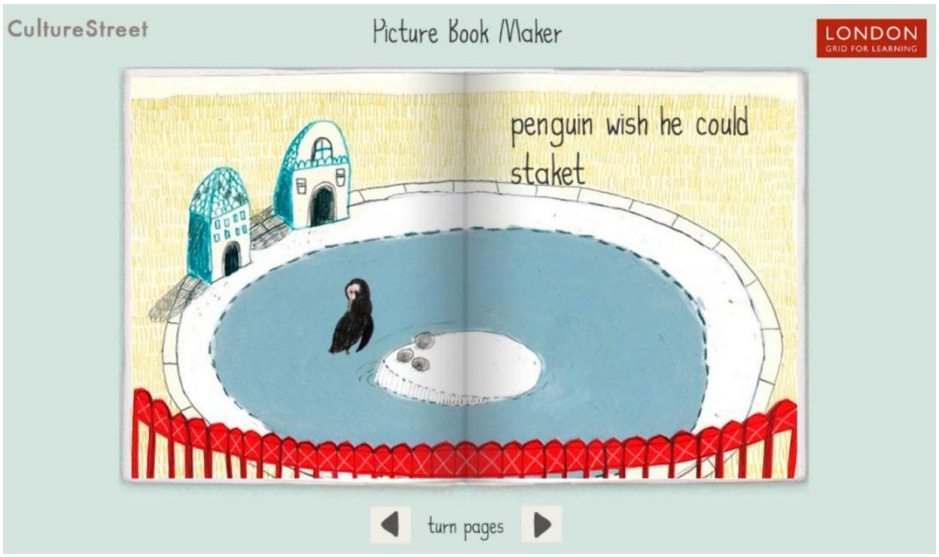
7.3. Authority index

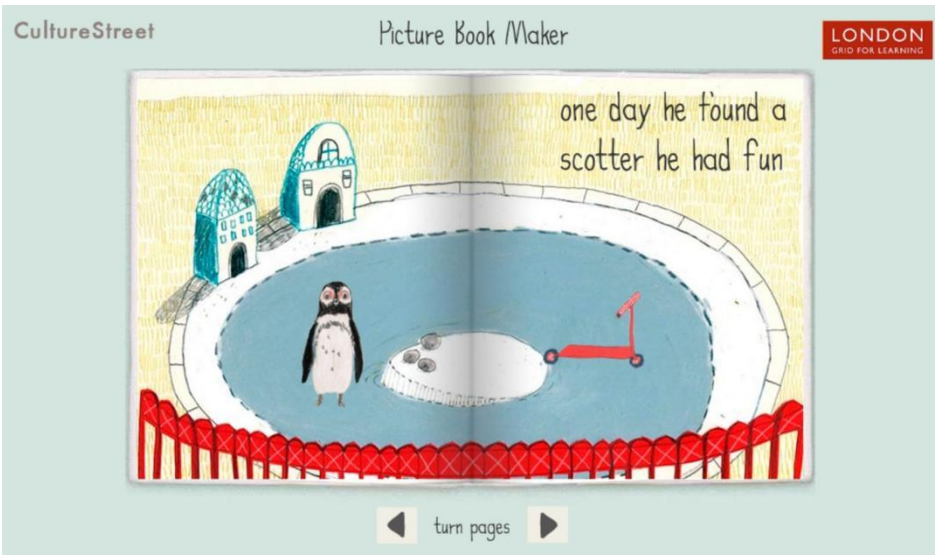
8. APPENDIX 1: The Grinch versus the Robot

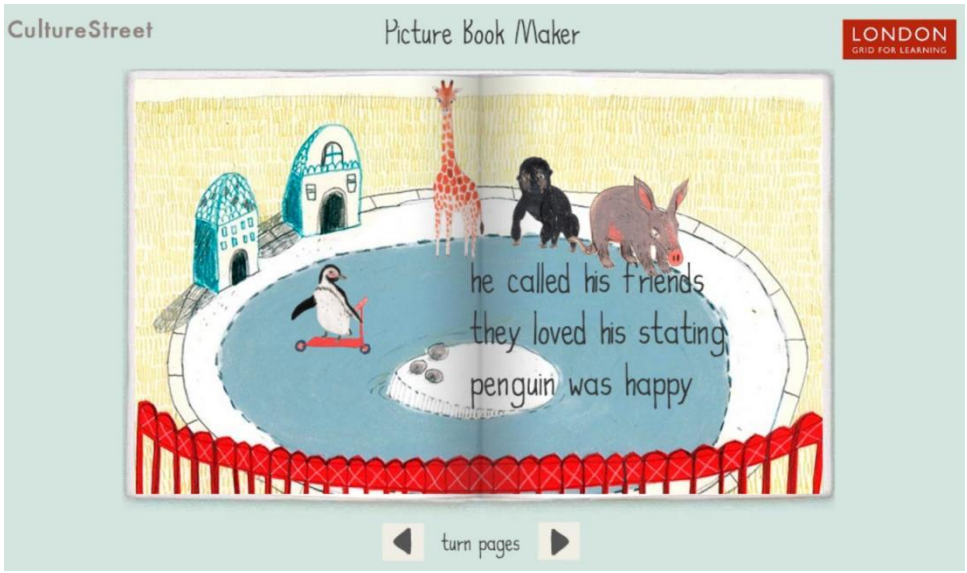


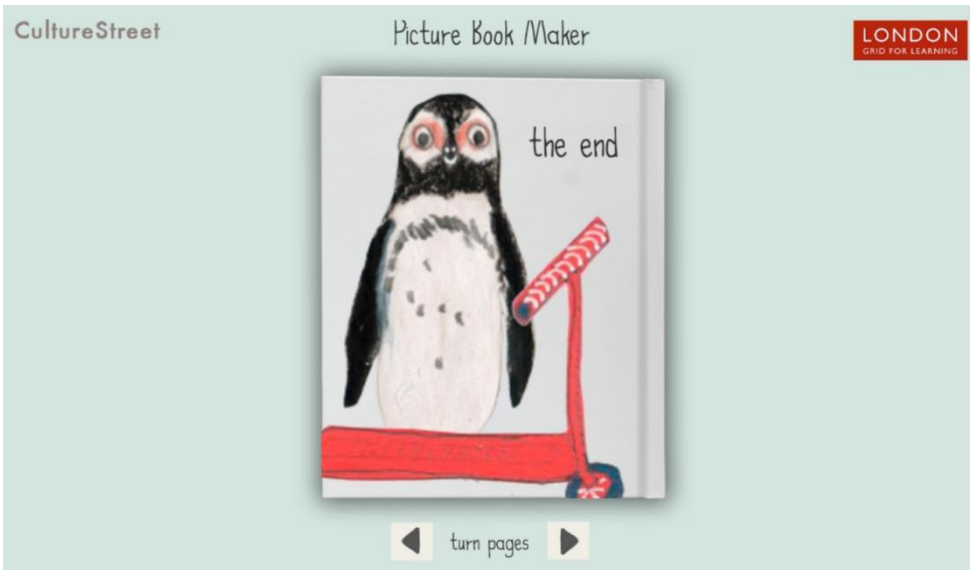
9. APPENDIX 2: Digital Stories








CultureStreet
Picture Book Maker
LONDON
GRID FOR LEARNING
he called his friends
they loved his stating
penguin was happy
turn pages


CultureStreet
Picture Book Maker
LONDON
GRID FOR LEARNING
the end
turn pages

10. APPENDIX 3: News test

Images	
Obviously photoshopped images	
Is the image identified correctly?	
Text	
Text completely written in capital letters	
Does the headline have anything to do with the text?	
Advertisements	
Are there Ads on the website?	
Are there many pop-up and banner ads?	
Current	
When was the information written?	
Is the information current for your purposes?	
Reliable	
What kind of information is included?	
Does the author provide references?	
Have experts been connected to this information?	
Does the information appear in other reliable sources?	
Author	
Who is the author?	
Who is the publisher?	
Does the text have a sponsor?	
Is the creator reputable?	
Purpose	
Is this fact or opinion?	
Is the author trying to sell you something?	
Is the information biased?	

11. APPENDIX 4: Language for debating

LANGUAGE FOR DEBATING	
AGREEING	DISAGREEING
I agree with… that…	I don't agree…
I share your point of view…	I disagree…
My perspective is similar to…	I see it differently…
Of course.	I have a different point of view…
You are right.	However,…
Yes, I agree.	On the contrary…
I think so too.	I'm afraid I have to disagree with you.
That's true.	I'm not sure about that, because…
I couldn't agree more.	I see your point, but…
You're absolutely right.	
OFFERING A SUGGESTION OR IDEA	EXPRESSING AN OPINION
Maybe we could…	I think…
We could think about…	I believe…
We could consider…	In my opinion…
Can I say something?	From my point of view…
Can I add an idea?	From my perspective…
Before you move on, I'd like to say…	Personally, I think…
I'd suggest that…	I feel…
ASKING FOR CLARIFICATION	REPORTING SOMEONE ELSE'S IDEA
What do you mean by…?	…said that…
Do you agree…?	…indicated that…
What do you think…?	…pointed out that…
What are your thoughts?	…shared that…
I have a question about…	Your position is…