ICTS AND COMPUTATIONAL THINKING TO FOSTER LANGUAGE SKILLS: A PROPOSAL BASED ON SCRATCH

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RESUMEN

El aprendizaje de lenguas evoluciona en paralelo con los avances tecnológicos. El uso de las TIC ha demostrado ser de gran utilidad en la enseñanza de lenguas y los nuevos estudios subrayan la importancia del pensamiento computacional. El objetivo de este artículo es diseñar una propuesta pedagógica en la que participen madres, padres, profesorado y alumnado. Se espera que esta propuesta favorezca el uso las TIC y el pensamiento computacional como entorno de inmersión lingüística fuera del aula. Para ello se usa el programa Scratch. A modo de conclusión, los resultados esperables de este diseño son una mejora de la competencia lingüística, de las destrezas tecnológicas y de la relación familia-escuela.

ABSTRACT

Language learning evolves in parallel with technological advances. The use of ICT has proven to be very useful in language teaching and new studies underline the importance of computational thinking. The objective of this article is to design a pedagogical proposal in which parents, teachers and students are expected to be involved. This proposal is supposed to foster the use ICT and computational thinking as a language immersion environment outside the classroom. To do so, the software Scratch is at the very core of the proposal. In conclusion, the expected results of this design are an improvement in linguistic competence, technological skills and the family-school relationship.

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PALABRAS CLAVE
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KEYWORDS
Technology; Language learning; Computational thinking; Educational technology

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1. INTRODUCTION

The importance of the chosen topic lies on the necessity to provide students with opportunities for immersion in a non-English speaking country such as Spain. Videogames seem to be an appropriate tool to reach this aim for they can be more than useful when it comes to generate multimodal inputs since it combines the semiocity of the visual dimension with the aural input. What make it of high interest is the motivational dimension since videogames are supposed to be highly enticing.

To reach that aim, the innovation consists of providing teachers with instruction on how to develop their own videogames according to the needs of their students by making use of the software Scratch. Teachers will have to learn how to use the code of Scratch and they will share their games with their students so that they will have out-of-class opportunities of immersion. Families would play then a key role when it comes to involvement since they would become an active agent along the innovation.

The present work consists of six blocks. The first one is a theoretical framework which analyses the evolution of the concept "bilingualism" in order to have a better understanding from a psycholinguistic outlook. Besides, the importance of informal education has been highlighted because the process of immersion through playing videogames takes place out-of-class. The informal contexts which are likely to take place in the realm of informal education have been bounded to videogames by analysing different contexts. Eventually, the importance and the potential of Scratch as a tool to create self-designed games has been highlighted.

The second block consists of the analysis of the context in which the innovation would take place whilst the third one consists of the objectives which can be summarised in providing students with out-of-class opportunities of linguistic immersion through self-designed videogames based on their needs.

With regards to the fourth block, entitled "innovation", it is important to highlight that the main beneficiaries would be the group of students since they are probably going to get their skills increased. Families and teachers are also going to be benefited since families would improve their relationship with their offspring at the same time they would be taking an active role at school. Teachers will also take profit because they will learn how to design videogames to cover the needs of their students. The innovation would consist of a series of phases which are supposed to conclude with a holistic evaluation to generate proposals of improvement for the next academic year.

The fifth block is bounded to the expected result and it is important to mention that the most important one lies on the possibility that students be able to use the target language in their daily routine beyond the classroom; this would probably make them feel more comfortable with the target language. Families are expected to have an active role whilst teachers are supposed to generate appropriate games to meet the needs of the stu-

dents. Eventually, the reader will find the last block which consists of a series of reflections on the topic.

2. THEORETICAL FRAMEWORK

2.1. Bilingualism

The definition of the term bilingualism is not an uncomplicated task. In order to shed some light on the concept, Weinreich (1953) bore Saussurean semiotics in mind and that helped him to establish three different types of bilingualism: coordinate bilingualism, compound bilingualism and subordinative bilingualism. Following his approach which is based on the philosophical problem of coexistence versus merging, the author makes use of coexistence as the fundament of coordinate bilingualism since he states that the coordinate bilingual speaker has two separate words in his/her mind for a concept or sign. On the other hand, the compound bilingual speaker would have a compound sign whose meanings are merged in the brain of the speaker. For illustrative purposes, the pictures below show schematically how both approaches to bilingualism would work in the mind of a speaker. Eventually, surbodinative type consists of leaning another language with the help of the first one. The speaker will thus learn a word in L1 and later on the same word will be learnt in L2 but with the peculiarity that it will not be bounded to the concept or actual sign but to the words linked to such a reality in L1.

It is important to highlight that the aforementioned sorts of bilingualism have not changed too much along time. In Chacón-Beltrán's (2015, p. 108) words "this categorisation was neither abandoned nor developed more fully due to the complexity of the neurolinguistic processes and the few advanced attained in the field". The previously mentioned author provides crucial information when it comes to the educational realm for the very reason that he deepened on the context in which each type of bilingualism is more likely to take place. The chart below summarises his perspective.

Type of bilingualism	Coordinate bilingualism	Compound bilingualism	Subordinative bilingualism
Psycholinguistic outlook	Languages are kept in different parts of the brain.	The meanings of the concepts are merged in the mind of the speaker.	One language first and then second language.
Context	A student learning a foreign language at school but not making use of it outside.	A son/daughter of two parents with different languages	A son/daughter of two parents with different languages but one of the languages is likely to become the dominant language over the other.

Table 1. Combination of the types of bilingualism and contexts. Source: Reprinted from Weinreich (1953) and Chacón-Beltrán (2015)

Nonetheless, there are more approaches to bilingualism. From Bloomfield's (1933, p. 56) outlook in which bilingualism consists of "the native like control of two languages" to other authors' approaches such as Diebold's (1961) who suggests that the former approaches do not bear *incipient bilingualism* in mind; it means that for this author it is important to take the initial learning stage into account even though the level of proficiency be really insufficient. Grosjean (1993) would however make an important point because from his perspective, there is coexistence among the languages of the speaker which would make a *linguistic ensemble*; such an ensemble would difficultly be divided into two monolonigualisms so this approach would go against Weinreich's (1953). This classical dichotomy of bilinguialism continues in the 21st century and there are definitions which are more restrictive, and others are continuum-oriented (Cabrera-Vergara, 2017). What is more, there is not still an agreement of what bilingualism means.

Rarely do authors agree when it comes to define bilingualism, but neuroscience and psychology have helped to shed some light on the processes of learning and acquisition of the second language which are really close to the one of bilingualism. Those sciences have helped to understand how human beings acquire or learn a language and it seems that language acquisition works in a very different way than the acquisition of other skills; the individual is prone to acquire a language until being approximately thirteen (*critical period*) whereas other skills such logic and maths are easier to develop from this age on (Mairal, Pérez, Teomiro, Ruiz & Peña, 2018).

On that line, it is important to differentiate between the concepts of language learning and language acquisition. Krashen (1973) makes a distinction between both terms and affirms that we should not underestimate the ability of adults to learn a second language. Acquisition is a unconscious process which is bounded to a large exposure to the target language together with communicative experiences whereas language learning has to do with conscious learning of linguistic forms (Vigliogia, 2014). Furthermore, the fact of language acquisition at preschool is remarkable for the very reason that it is supposed to be (Arslan, 2011).

As Primary students are between 6 and 12, we should take into account that the appropriate concept is acquisition and that they can become bilingual. Following the former ideas, the exposition to the language should be as ample as possible and immersion could be a key concept to help them achieve bilingualism. The first immersion programs were created in the Second World War in the US (Baker, 2011). Those programs became quickly a new form o bilingual education in the mid-60s in Canada where there were two languages: English and French. The aforementioned programmes were called *immersion programs* and their goals were focused on providing students with competence in both languages by teaching academic subjects in both English and French (Genesee, 2008).

Soon did governments in other countries realise of the effectiveness of this sort of approach to language teaching since this approach is supposed to "leads to early acquisition of the second language and high proficiency in that language" (Genesee, 1995, cf. Li,

Kirby, Cheng, Wade-Wolley & Qiang, 2012, p. 423). The aforementioned authors analysed how immersion programs were imported to the elementary schools in Chinese cities (such as Beijing and Shanghai) and they noticed that there should be adapted to the Chinese reality since English cannot be taught as a second language in China but as a foreign language. There can be variation with the regards to the velocity of the program depending on the mother tongue of the group of students (Valentino & Reardon, 2015). Consequently, there is an important remark to emphasise when it comes to applying immersion programs in other countries since Kersten's (2010) research proved that German students had better results and made a quicker progress with English bilingual programmes than with French bilingual programs.

> The common form that the languages of the Germanic branch had before they became differentiated is known as Germanic or Proto-Germanic. It antedates the earliest written records of the family and is reconstructed by philologists in the same way as is the parent Indo-European. The languages descended from it fall into three groups: East Germanic, North Germanic, and West Germanic (Baugh and Cable, 2012, p. 28).

To understand such a fact, it is important to bear *psychotypology* in mind*;* this concept was coined by Ringbom (2006) and is bounded to the perception of proximity that speakers of different languages have. As a result, the typological relationship between languages is a crucial factor to bear in mind when it comes to immersion programmes. Guarddon (2011) defines the concept of typological classification and phylum as follows:

> Typological classifications of language lead to the establishment of language families which consist of language stocks that are considered to be related by common origin because of cognates in vocabulary. Concerning the notion of language family, the student must also be acquainted with the meaning of phylum. This category encompasses a number of language families and very often the term phylum is equated with that of language family and both terms are often used interchangeable (p. 390).

Following the former approaches, Spanish and English would belong to the same phylum which is Indo-European but there differ in the families they belong to. Spanish is an Italic, Romance and Ibero-Romance language whereas English is a Germanic, West-Germanic and Anglo-Frisian language. Those differences might be bounded to the concept of psychotypology and Spanish speakers may perceive English as a distant language which is not easy for them to learn.

2.2. Informal contexts and language learning

Informal learning may play a key role when it comes to language learning, according to CEDEFOP (2008, p.3) it is the "learning resulting from daily activities related to work, family or leisure. It is not organised or structured in terms of objectives, time or learning

support. Informal learning is in most cases unintentional from the learner's perspective". However, there seems to be a disagreement with the unintentional dimension of the concept since Schugurensky (2000) distinguishes three categories: self-directed learning, incidental learning and socialization.

	TYPES OF INFORMAL LEARNING		
	Self-directed learning	Incidental learning	Socialization
Intentional	X		
Conscious	X	X	

Table 2. Combination of the types of bilingualism and contexts. Source: Own Elaboration

Informal education plays a key role in children's acquisition of L2 at early stages for the very reason that the activities they are going to carry should be really similar to the ones they would do in informal contexts (Arslan, 2011). It is important to highlight that even though formal instruction is not necessary when it comes to L2 acquisition at early ages, it speeds up the process of natural acquisition (Ellis, 2008). Therefore, it is important to combine both, informal education and formal education to boost the acquisition of the second language. Nonetheless, there is not still a big corpus of literature on that topic since it is emergent. The position of teachers regarding that point is that combining out-of-class learning with classroom learning enriches students' learning and that there is not a crucial motivation to believe that out-of-class learning is less effective than classroom learning (Benson, 2011).

It is also important to bear in mind the four dimensions of out-of-class language learning established by the author since they will be a crucial for our research.

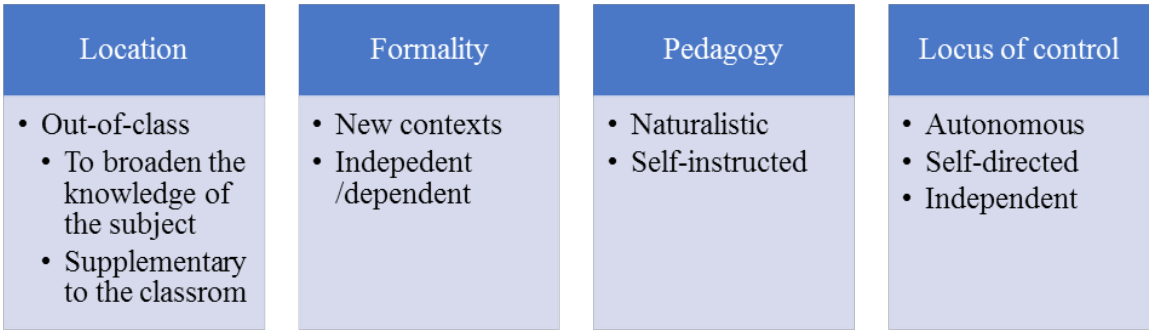

Figure 2. Dimensions of out-of-class language learning. Source: Adapted from Benson (2011)

Corpas's (2016) study shed some light on the relation between the relationship between informal learning and formal learning; she affirms that informal methods are not commonly used by students since 90% of the students in her study said that they did not

make use of informal resources such as books, the media, the Internet, etc. to practise English outside the classroom. Notwithstanding, a 57% of the students in her study usually listen to music in English. Among the conclusions of this research there are two main reasons for this result: the first one is the lack of motivation of students for they might consider English as a normal subject which can also be learnt through formal instruction, the second reason is bounded to the lack of opportunities they might have when it comes to find context to practise the target language.

Eventually, it is also important to bear the attitude of parents towards informal contexts in mind. There is little literature on that topic but there is a study by De Wilde, Brysbaert, & Eyckmans (2019) about parents' tendency of involvement in the whole process of out-of-class language learning. In fact, according to this study, parents showed a preference towards digital materials (games, television, etc.) to traditional printed materials.

2.3. Videogames as informal contexts for language learning

Online computer games seem to be progressively attracting more and more people because even though a big sector still have reluctancies with the binomial games-learning, people have started to consider them as a tool that provides them with opportunities to be exposed to the second language; teachers may take advantage of that by creating activities for out-of-school settings that provide them with opportunities of using the language outside the classroom but they must be prepared to do so pedagogically and technologically (Kuure, 2011). The good thing about videogames is the multimodal setting which helps students understand the context of the dialogues because the suprasegmental level together with the images and sounds help them receive a contextualised input (Gee, 2008).

The learning through online video games might take place in two different moments: during the game and after the game. "In-game" activities would be the ones that take place during the process of gaming but the "beyond-game" dimension has to with the more than common involvement of gamers in on-line communities in which they discuss about the game and they thus produce written speech chunks (Ryu, 2013).

Nonetheless, the aforementioned online environments might not be safe enough for young learners since according to Cotler & Fryling (2016) there are different factors which can lead to cyberbullying such as: anonymity online, lack of fear of punishment, too much freedom online or cases of real bullied who need to cyberbully online to take their frustration out. Defining cyberbullying is a difficult task because it seems to be a hybrid between bullying and a more complex set of phenomena with a big variety of risk factors (Zych, Ortega-Ruiz, & Marín-López, 2016). Some teachers might feel a kind of reluctancy or discommodity in virtual environments but they can help students avoiding certain behaviours which can lead to perpetration or to victimisation if they prepared themselves

to do so by following specific programmes such as *Asegúrate* (Del Rey, Ortega-Ruiz, & Casas, 2019). Therefore, following the aforementioned authors, using this kind of contexts can help students to improve their language skills at the same time it is promoting an ethic use of the ICTs.

Not only can online games be used to provide students with opportunities to learn English but there are also different games such as arcade, roll, simulation, etc., which can provide them with "in-game" activities. Their use can result in positive outcomes when it comes to language, and they can also encourage students to reflect on their learning and to gain autonomy (Baierschmidt, 2012). Most of researchers use games developed by themselves to carry out their research whilst another important sector makes use of immersive games such as *Warcraft* (Hung, Yang, Hwang, Chu, & Wang, 2018). It is important to clarify that immersion in the field of gaming can be defined as an experience that involves gamers and make them keep on task (Jennett et al., 2008). *The Sims* is a well-known game of simulation which provides gamers with an immersive experience. This game was analysed by Ranalli (2008) because his study proved that the use of this game with "in-game" activities boosted the learning of vocabulary by creating specific tasks and activities which served as a guide for students. Besides, the study of Hung et al. (2018) also concluded that what the students improved the most when using videogames was vocabulary; however, their study shows that a considerable amount of students had their outcomes increased in all of the skills or the integrated skills (reading, writing, speaking and listening).

2.4. Scratch as a tool for the development of MALL games in CLIL contexts or in the EFL classroom

Scratch is a free programming language and every person can develop different kind of digital contents such as games and animations (Lifelong Kindergarten, 2019). Particularly, there is a set of project genres that fit in the classroom such as: narrative models, presentations, animated models, problem solvers/calculators and meaningful games (Patterson, 2016). Scratch, in addition, has a series of pedagogical features that make it an essential tool for teachers and pre-service teachers such as: promotion of computational thinking, accessibility, potential of motivation, social features and learnability (Papadakis, Kalogiannakis, Orfanakis, & Zaranis, 2019). A study carried out by Fesakis & Serafeim (2009) reported that pre-service teachers were willing to implement ICT tools in their educational praxis, but they felt really high levels of anxiety. Besides, the typology of barriers can be classified according to the following categories: accessibility, change resistance, time, training, and technical support (Bingimlas, 2009). Nonetheless, using Scratch seems to increase the interest of pre-service teachers in using the ICT whilst after programming with it their levels of stress and anxiety seem to be lower. Following Aeve's (2012) report, teachers are who should propose to make use of videogames in class but a vast majority think they lack information and orientation on the appliance of vi-

deogames to education; even though schools slightly perceive a tendency of an increasing number of educational videogames which are similar to real videogames, they think that the catalogue of games is not wide enough and it does not meet the students' needs.

This aforementioned programming tool could be applied in CLIL settings. CLIL stands for Content Language Integrated Learning and Coyle (2005) established the four essential Cs for CLIL planning: content, communication, cognition and culture.

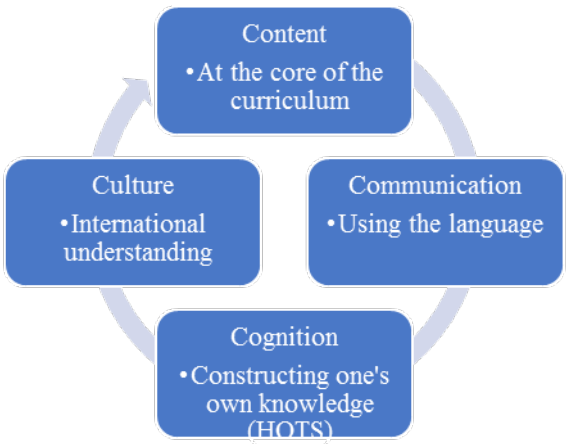

Figure 3. The Cs of CLIL. Source: Adapted from Do Coyle (2015)

Scratch digital resources must meet Mehisto's (2012) criteria below to be useful for CLIL settings and even for EFL settings:

a The learning intention should be clear for students.

b It promotes proficiency.

c It develops the skills and learners' autonomy.

d Includes different types of assessment (self-assessment, peer-assessment and formative assessment).

e It helps create a safe learning environment.

f It fosters cooperative learning.

g It makes use of real English.

h It fosters critical thinking.

i Scaffolding has an important role.

j It provokes meaningful learning.

It is very important to take into account that native digitals do not only make use of PCs, but they also use mobile phones and tablets. MALL stands for Mobile Assisted Language Learning, and it allows language learning from portable or mobile ICT devices. One of the big advantages of Scratch is that it is multiplatform, it means, that people can use it in any device; be it a mobile phone or a laptop. Therefore, the activities designed for the CLIL or the EFL classroom can be played in the mobile phone under MALL paradigm to foster the learning in an out-of-class context.

3. METHODOLOGY

The main goal is to design an ICT-based proposal that provides young English learners with opportunities of immersion outside the EFL/CLIL classroom. Besides, there are subsidiary objectives:

- To increase the knowledge of the teaching teams regarding the ICTs and their educational possibilities inside and outside the classroom.
- To provide both children and parents with a tool that allows them to get in touch with the target culture and with real English in an accessible way.
- To provide both content subject and L2 teachers with opportunities for learning how to choose and how to design simple video games.
- To promote bilingualism and multiculturalism in and outside the classroom.
- To prepare young learners for autonomous learning and to increase "the learn-to-learn" competence.

3.1. Beneficiaries

The primary beneficiaries are students since they are going to learn the target language outside the classroom at the same time their digital skills are supposed to increase whereas their relation to parents should increase since they need to work together.

The secondary beneficiaries are both students and parents. Teachers are going to be taught on how to design a videogame by making use of Scratch. Parents are also beneficiaries for the very fact that they are getting their relationship with both teachers and children improved at the same time they are also having contacts with the target language and with the target culture; not to mention their involvement in the tracking of the syllabus of children is supposed to increase so it may be a key factor when it comes to prevent future and possible educational failure.

3.2. Phases of the innovation

	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
DEx	X									
P1	X									
P2		X	X							
P3				X	X	X	X	X	X	
P4					X	X	X	X	X	
P5										X
FA						X		X	X	
FEx										X

Table 2. Phases of the innovation. Source: Own Elaboration

There are five phases:

1 Diagnostic Assessment (DEx). This first phase will be devoted to assessing the level of the students according to the guidelines stablished by the CEFR. From this test, the teachers involved in the innovation (P1) should do a report with the weaknesses and the strengths of their students since it will be the departure point of the next phase.

2 The second phase (P2) is devoted to the instruction of teachers in this subject and there will be workshops to teach them on how to create videogames with SCRATCH since it allows a user-friendly creation of videogames with multimodal inputs for students. The videogames they are going to create should meet the needs of the students; it means they should be related they weaknesses according to the initial test.

3 The third phase (P3) consists of the use of videogames by students outside the classroom. Parents will be encouraged to be actively involved and to track the process. This phase starts strategically in December due to the fact that Christmas Holidays would be about to start, and they can play at the videogames at home in family.

4 The fourth phase (P4) is somehow simultaneous to the third phase, but it starts a month later with the aim to track the improvements of the linguistic skills of the students. This phase consists of:

4.a Regular surveys through the PLE of the school in which parents have to answer a set of questions about the involvement with the activities at home. They will be also asked about feedback on how to improve the experience.

4.b Transversal phase: this subphase will consists of series of skills (FA) tests to test the level of the students in accordance with the CEFR. Those tests will serve as formative evaluation since they will report whether students are making progress on their skills or not. The aforementioned skills tests will take place in the second week of February, the first week of April and the last week of May.

5 The final test (FEx) will take place the last week of June and the results will be compared with the ones of the skills tests and with that of the diagnostic test to check the effectiveness of the programme. With those results the teaching team should create a set of developmental points for the following year (FA).

The intervention consists of the following activities:

a Design of the diagnostic test.

The teaching team composed by CLIL teachers and EFL teachers should meet to design a test which integrates the four skills and it should be designed under the guidelines of the CEFR. The advisable level of the test is A2 because students who are finishing Primary Education should have got that level.

This test will consist of exercises which must cover the four skills and there should also be exercises of grammar and vocabulary; they always have to combine bottom-up and top-down techniques.

b Workshop for teachers

Teachers will be told to create games with Scratch for their students. This workshop will be leaded by two professionals: an expert in ICT and an expert in CLIL. The expert will provide teachers with opportunities of developing games by making use of the Scratch code of programming. The final product of this workshop should be a set of games which will be provided to students when required.

For example, the science teacher wants to work with the vocabulary of the environment. Therefore, s/he has to create a Scratch code that creates a game of questions and answers by making use of that vocabulary in order to turn the receptive vocabulary into productive vocabulary. For illustrative purposes, a basic code is offered here (next page).

c Tracking the involvement and engagement of the family through questionnaires which are supposed to be available in the PLE of the school. Parents will answer one questionnaire a fortnight and teachers will meet every fortnight to discuss the levels of involvements and to look for solutions in case they are not high enough.

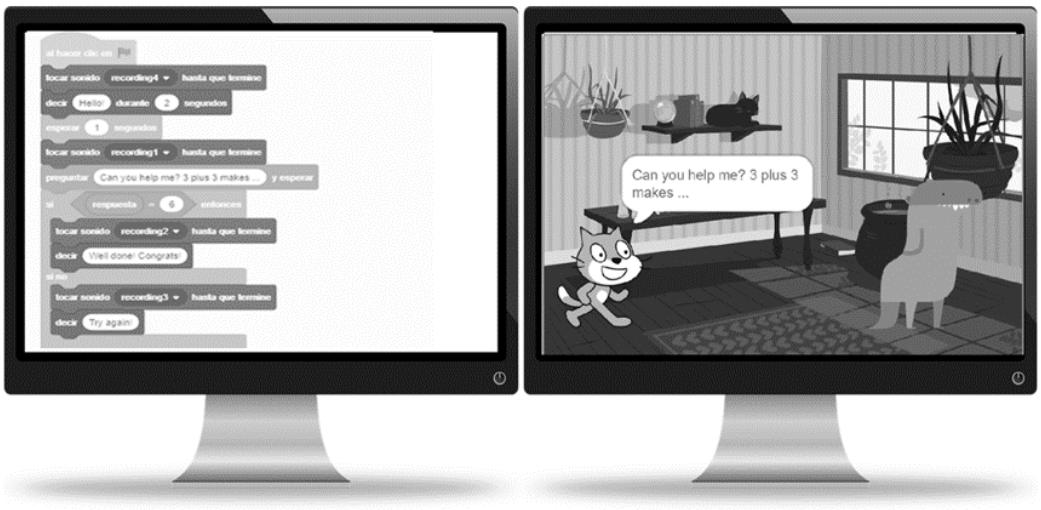

Figure 4. Code and screenshot of a CLIL Scratch game. Source: Own elaboration

d Tracking the development of the linguistic skills along the project by making use of integrated skills tests adapted to the CEFR which serve as an indicator of the progress of students. These tests should be thoroughly designed in accordance with the activities they have done out-of-class. It means that if they have been working with vocabulary linked to the environment, it does not make sense if they are asked about other type of vocabulary.

A final test which will also follow the guidelines of the CEFR, and its results will be compared with the diagnostic test and the other ones to check quantitatively the effectiveness of the project. In case it has not been as good as expected, the teaching team should design a new plan of action with amends for the next year by reflecting on the strengths and weaknesses of the experience.

3.3. Resources

The main resources are mobile phones, laptops and tablets. Students may have one of them at home but in case they do not they can make use of the ones in the school or the ones in the public library since both the school and the public library are open in the afternoon and there are ICT rooms where they can freely access whenever they need it.

3.4. Evaluation of the innovation

There will be a triple assessment: one devoted to the language skills of the students, another devoted to the experience from families' outlook and a former one carried out by teachers.

A. Students

As mentioned in former sections students will be assessed by four skills tests which must meet the following criteria and with the following percentages:

CEFR level	A2	B1.1 advised for gifted students	A.1.2. or lower advised for SEN students
RECEPTIVE SKILLS			
LISTENING		**READING**	
Activities	**Percentage**	**Activities**	**Percentage**
Bottom-up activities (filling the gaps, etc.) Top-down activities (short answer, comparison)	20 % Pass mark: 13 / 20	Bottom-up activities (filling the gaps, etc.) Top-down activities (short answer, comparison)	20 % Pass mark: 13 / 20
PRODUCTIVE SKILLS			
Writing	**Percentage**	**Speaking**	**Percentage**
Criteria: Grice's maxims	20 % Pass mark: 13 / 20	Criteria: Grice's maxims	20 % Pass mark: 13 / 20
GRAMMAR & VOCABULARY			
Grammar	**Percentage**	**Vocabulary**	**Percentage**
Multiple choice, filling the gaps, etc.	10%	Multiple choice, crosswords, filling the gaps, etc.	10%

Table 3. Proposal for the design of the tests. Source: Own elaboration

On that way, objective information on the process of learning language can be retrieved and the skills which are the most benefited by videogames outside the classroom will be detected through the tests. Besides, the developmental points will become 'targets' to work with children to help them improve.

B. Parents

Parents will have to do a survey a fortnight to let teachers know about their involvement in the process. It will consist of a structured online questionnaire that they should respond in the PLE such as the following one:

Question	Explanation
Q1	What are your thoughts on the implementation of 'digital bilingualism'?
Q2	How is your conception of game now? Better or worse than at the very beginning of the programme?
Q3	How often do you play with your kids to English games outside?
Q4	What do you like the most about the activities? What do you like the least?
Q5	Do you really feel your children are learning?
Q6	What would you change to make it more engaging?

Table 4. Questionnaire for parents. Source: Own elaboration

A. Teachers

Teachers have to self-assess and peer-assess the tools they have created and to reflect on their utility. Each teacher will fulfil a rubric on his/her project and another one on a colleague's project. The objective of doing so is to learn from each other and to develop a network of involved teachers aiming at working collaboratively and cooperatively. Eventually, reflection is placed at the core of the teaching profession because they will reflect on the own work and in other colleagues' work and they can then improve their tools by getting new ideas on what other teachers do.

The rubric contains the following items:

Item	4	3	2	1
Attractiveness	My chose of fonts, colour, graphics, etc. enhance the product.	My chose of fonts, colour and graphics is appropriate but could be better.	My chose of fonts, colour and graphics or appropriate but I should have combined them better.	My chose of fonts, colour and graphics is poor and do not enhance the presentation.
Subject content	The game covers the topic with a big degree of depth and students can have opportunities to learn more.	The game covers the topic with a good degree of depth, but students cannot have opportunities to learn more.	The game covers the topic with a normal degree of depth and students cannot have opportunities to learn more.	The game poorly covers the topic and students cannot have opportunities to learn more.
Language content (just for CLIL teachers because the subject content for	I focus on an aspect of language and I cover it in depth by focusing on forms	I focus on several aspects of language and I do not cover them all in dep-	I focus on generalities of language and I do not cover them all in depth. I do	I attempted to cover all the linguistic forms superficially, but I did not focus on

EFL teachers would be the language itself)	and by providing them with a multimodal environment.	th. I do not focus on forms, but I provided them with a multimodal environment.	not focus on forms but provided them with a multimodal environment.	forms nor provided students with a multimodal environment.
Code	My code allows me to do exactly what I wanted to do and the product is what was in my mind.	My code allows me to do what I wanted to do up to some degree and it was not exactly what I thought but accomplishes the main purpose.	My code almost does what I wanted it to do but I found many difficulties and restrains when bringing my idea to reality.	My code does not accomplish the purpose and there are several mistakes when running it on the machine.

Table 5. Rubric for teacher's self-assessment Source: Own elaboration

B. Final assessment

The assessment which will take place at the end of the school year has to take the aforementioned ones into account to create a set of developmental points and targets for the next academic year. It should be done by all the teachers involved by taking all the data retrieved from the experience into account by following the rubric below:

Dimension	4	3	2	1
Students	All of the students have increased their skills at it shows the test and they are involved as the parents' surveys report.	Most of the students have increased their skills at it shows the test and they are involved as the parents' surveys report.	Some students have increased their skills at it shows the test and they not are as involved as expected as the parents' surveys report.	Few students have increased their skills and involvement is improvable.
Parents	Parents' willingness of using the new tools is high, they like the activities and they feel their children are learning.	Parents' willingness of using the new tools is average, they like the activities and they feel their children are learning.	Parents' willingness of using the new tools is low, they like the activities but have some doubts about their effectiveness and they feel their children are learning.	Parents are not keen on the new tools and they feel their children are not learning because they have deep doubts on the effectiveness of the new tools.

Teachers	Teachers' creations are attractive, integrate content and language when required and have codes that suit perfectly with their initial idea.	Teachers' creations are mostly attractive, integrate content and language when required and have codes that suit appropriately with their initial idea.	Teachers' creations are not quite attractive, but they integrate content and language when required and have codes that could be improved.	Teachers' creations are not really attractive nor integrate content and language nor show a good use of the programming tool.

Table 6. Rubric for the evaluation of the project. Source: Own elaboration

From that rubric they should create a plan of improvement for the following year by taking the following dimensions into account:

a Students: involvement, motivation and the development of grammar, vocabulary and the four skills (reading, writing, speaking and listening).

b Parents: involvement and willingness.

c Teachers' applications: attractiveness, CLIL approach and coding.

4. DISCUSSION AND CONCLUSIONS

Bearing in mind that many students do not have opportunities of immersion around the world, they are expected to make use of the new contexts they are going to be provided with. It will probably help them increase their skills and therefore, their performance, when it comes to produce by making use of the target language. Nonetheless, even though they are expected to be engaged, if games are not appropriate nor fun, they would probably avoid them if they perceive them as an extension of school.

Teachers have a key role then since the knowledge they are going to gain in the realm of the ICT should help them develop appropriate and appealing games for the students to practice in informal contexts with families. Such a big responsibility might overwhelm them so they have to learn how to explode the potential of the videogames without pressure. The increase of this knowledge would then be expected to turn into the potential to explore the new possibilities that Scratch offers. Teachers are then also expected to feel more and more comfortable with the use of the ICT and to have their levels of anxiety towards the new technologies decreased.

Parents involvement is supposed to be high since their children would have opportunities to share time with them at the same time they are learning. This is not incidental but thoroughly thought because one of the biggest problems in the modern world is linked to conciliation and providing families with the opportunity to share an amusing

time with the children at the same time they are learning should help families to have positive attitudes towards the school and towards videogames because they might help them with regards to conciliation.

Besides, L2 or CLIL teachers are expected to engage actively in the innovation in order to enrich the knowledge of their students. This expectancy has to do with the fact that teachers would become the generators of digital contents which are contextualised, and this contextualization will help them explode their creativity. Sharing it with the rest of teachers will help them feel their work is worthy.

The promotion of bilingualism and multiculturalism is a key factor, and it might be achieved through videogames since students will have to work with the target language and teachers might design videogames in multicultural contexts since Scratch allows to use different scenes which can belong to different cultural backgrounds.

Eventually, autonomous learning is likely to increase to because students will probably improve their learn-to-learn skill by making use of the videogames at home. Firstly, they will probably learn that they can generate alternative ways for studying themselves to make studying amusing.

Learning foreign languages seems to be a crucial factor in a globalised and interconnected world which needs a vehicular language to stablish communication with people from different cultures. There are bilingual countries such Canada in which students have the opportunity to make use of the second language outside the classroom, but this is not the case of Spain with regards to the English language. Spanish students do not have contexts to practise the language they are learning at school outside and as immersive experience have been proven to be effective, they should be given that opportunity.

Videogames might be a good tool to reach that aim for they offer a double immersion, linguistic immersion and game immersion. The first one is the one of our interests because it will offer a multimodal experience in which students will be able to interact and to receive different kinds of inputs from aural to written. The second one is closely bounded to attention because students' attention is usually captivated by ICT devices. This second type of immersion is supposed to help students be on task whilst the linguistic immersion is expected to provide them with an appropriate and contextualised exposition to the target language.

The key element of this proposal of innovation is that parents develop their own games based on the needs of the classroom by making use of Scratch. After a revision of the state of the art, teachers show willingness to implement videogames in their educational programmes to enrich them whilst the main difficulty is that they might find troubles due to lack of ICT skills or because they do not find appropriate commercial games for their purposes.

Parents would play a key role since they have to track the whole process, so they are expected to be engaged and to be active members since they should provide teachers

with feedback on how students are doing at home. They are also supposed to play the games with the children because it would help them have an amusing time at the same time they are learning the target language. This might strengthen both the relationship between the family and the school and the relation between students and parents because they will have a fluent communication with teachers and they will also feel they are part of the education of their children whilst they will be able to share more time with students too.

Students then are expected to make use of the games designed by teachers to have their skills increased and they are supposed to be motivated to learn autonomously by making use of videogames. Their marks will be measured quantitatively along the course by making use of 4-skills test and they will reveal the effectiveness of the programme in the realm of language learning.

Notwithstanding, it is important to highlight that teachers might struggle at the very beginning because creating videogames is not an easy task and they will improve with time, but they should be given support to go ahead with the innovation. In case the results are positive, they would probably feel more motivated towards the creation of videogames. Scratch is the software which is likely to help them the best for coding with it is not as difficult as with other programming tools. Nonetheless, it requires time because thinking to design codes is not usually an easy task since they will need to translate their ideas into the language of the computer and they might be frustrated at the very beginning but the workshops are supposed to help them overcome this sort of problems.

The main risk is that students do not feel motivated to use this sort of games because they might feel they are not fun enough for them since they are usually accustomed to other types of game with better graphics and a constant reinvention of playability in the side of the big brands of videogames. Families would be then an important factor since they can encourage the children to play by playing together and by showing positive attitudes towards gaming at home.

Nonetheless, it is important to make mention that families usually have a bad perception of videogames when it comes to the field of education, since they tend to think that both concepts do not match. Their views might probably change after the experience if they observe that the English level of the children is getting better.

There would be different assessment tasks along the process which will consist of standardised tests. The first one is a diagnostic test which will serve as a medium to identify the needs of the group of students. The later ones will consist of continuous assessment to check whether the innovation is meeting the goals is what designed for and to generate proposals of improvement. The last one will consist of a holistic evaluation in which teachers have to fix developmental points for the following course in order to improve.

To sum up, Scratch might be a tool which may provide EFL/CLIL teachers with a new set of resources which will probably help them explode the potential of videogames in out-of-class contexts. The informality of the new context together with the presence of families might be a determining aspect to strengthen and improve the relationship between all the members involved in the educational process at the same time that the skills of students in the realm of the foreign language are expected to gradually improve because of the immersive experience they are going to be provided with. One of the main inconveniences is that parents would probably have a negative feeling on videogames and education whilst teachers might be overwhelmed if they do not have experience with programming. However, Scratch is an accessible software when it comes to coding and teachers will probably have their anxiety reduced as long as they can translate their ideas into the language of Scratch whereas families might probably change their negative points on videogames whether they see students are becoming better users of the target language because of the linguistic immersion.

BIBLIOGRAPHY

AEVI. (2012). *Estudio Videojuegos, educación y desarrollo infantil: Fase cuantitativa*. Recuperado de http://www.aevi.org.es/web/wp-content/uploads/2015/12/10376-Informe-Adese-Fase-Cuantitativa-200120121.pptx

Arslan, M. (2011). Second Language Acquisition in the Context of Informal Education. In A. Akbarov. (Coord.). *Languages for Specific Purposes in Theory and Practice* (pp.194-214). Newcastle: Cambridge Scholars Publishing

Baierschmidt, J. (2012). Learning English through video gaming. *asKUIS*, *23*, 1-26. http://id.nii.ac.jp/1092/00000912/

Baker, C. (2006). *Foundations of bilingual education and bilingualism*. Clevedon: Multilingual Matters.

Baugh, A., & Cable, T. (2012). *A History of the English Language*. (6ª. ed.). London: Routledge.

Benson, P. (2011). Language Learning and Teaching Beyond the Classroom: An Introduction to the Field. In P. Benson & H. Reinders. (Eds.). *Beyond the Language Classroom* (pp.7-17). Hampshire: Palgrave Macmillan

Bingimlas, K. A. (2009). Barriers to the Successful Integration of ICT in Teaching and Learning Environments: A Review of the Literature. *Eurasia Journal of Mathematics, Science and Technology Education*, *5*(3), 235-245. DOI: https://doi.org/10.12973/ejmste/75275

Bloomfield, L. (1993). *Language*. New York: Holt.

Cabrera-Vergara, I. (2017). Dominar dos idiomas vs. bilingüismo. Definiendo un bilingüismo inclusivo y operativo. *Thélème: Revista Complutense de Estudios Franceses*, *32*(1), 23-33. DOI: https://doi.org/10.5209/THEL.53083

CEDEFOP. (2008). *Terminology of European Education and Training Policy*. Luxembourg: Office for Official Publications of the European Communities.

Chacón-Beltrán, M. R. (2015). *Sociolinguistics*. Madrid: UNED.

Corpas, M. D. (2016). La educación informal en el aprendizaje del inglés como lengua extranjera. *Tejuelo*, *24*, 68-91. DOI: 10.17398/1988-8430.24.1.68

Cotler, J., & Fryling, M. (2016). Causes of cyberbullying in multi-player online gaming environments: Gamer perceptions. *Proceedings of the Conference on Information Systems Applied Research*. Recuperado de http://proc.conisar.org/2016/pdf/4258.pdf

Coyle, D. (2005). CLIL: Planning tools for teachers. *Nottingham: University of Nottingham*.

De Wilde, V., Brysbaert, M., & Eyckmans, J. (2019). (online). Learning English through out-of-school exposure: which levels of language proficiency are attained and which types of input are important? *Bilingualism: Language and Cognition*, 1–15. DOI: https://doi.org/10.1017/S1366728918001062

Del Rey, R., Ortega-Ruiz, R., & Casas, J. A. (2019). Asegúrate: An Intervention Program against Cyberbullying Based on Teachers' Commitment and on Design of Its Instructional Materials. *International Journal of Environmental Research and Public Health*, *16*(3). DOI: https://doi.org/10.3390/ijerph16030434

Diebold, A. R. (1961). Incipient Bilingualism. *Language*, *37*(1), 97-112. DOI: https://doi.org/10.2307/411253

Ellis, R. (2008). *The Study of Second Language Acquisition*. Oxford: Oxford University Press.

Fesakis, G., & Serafeim, K. (2009). Influence of the familiarization with «scratch» on future teachers' opinions and attitudes about programming and ICT in education. *ACM SIGC SE*, *41*(3), 258-262. DOI: https://doi.org/10.1145/1595496.1562957

Gee, J. P. (2008). Learning and Games. In K. Salen. (Eds). *The Ecology of Games: Connecting Youth, Games, and Learning* (pp.21–40). Cambridge, MA: The MIT Press

Genesee, F., & Lindholm-Leary, K. (2008). Dual Language Education in Canada and the USA. In J. Cummins & N. Hornberger. (Eds). *Encyclopedia of Language and Education* (pp. 253-266). New York: Springer.

Grosjean, F. (1993). Le bilinguisme et le biculturalisme. Essai de définition. *Revue Tranel (Travaux neuchâtelois de linguistique)*, (19), 13-41.

Guarddon Anelo, M. C. (2011). *Diachrony and Typology of the English Language through the text*. Madrid: Ediciones Académicas.

Hung, H.-T., Yang, J. C., Hwang, G.-J., Chu, H.-C., & Wang, C.-C. (2018). A scoping review of research on digital game-based language learning. *Computers & Education*, *126*, 89-104. DOI: https://doi.org/10.1016/j.compedu.2018.07.001

Jennett, C., Cox, A. L., Cairns, P., Dhoparee, S., Epps, A., Tijs, T., & Walton, A. (2008). Measuring and defining the experience of immersion in games. *International Journal of Human-Computer Studies*, *66*(9), 641-661. DOI: https://doi.org/10.1016/j.ijhcs.2008.04.004

Kersten, K. (2010). DOs und DONT's bei der Einrichtung immersiver Schulprogramme. In C. Bongartz & J. Rymarczyk. (Eds.). *Languages Across the Curriculum: Ein Multiperspektivischer Zugang* (pp. 71-92). Frankfurt: Peter Lang.

Krashen, S. (1973). Lateralization, language learning, and the critical period: some new evidence. *Language Learning*, *23*, 63-74.

Kuure, L. (2011). Places for Learning: Technologymediated Language Learning Practices Beyond the Classroom. In P. Benson & H. Reinders. (Eds.). *Beyond the Language Classroom* (pp.35-46). Hampshire: Palgrave Macmillan

Li, M., Kirby, J. R., Cheng, L., Wade-woolley, L., & Qiang, H. (2012). Cognitive Predictors of English Reading Achievement in Chinese English-Immersion Students. *Reading Psychology*, *33*(5), 423-447. DOI: https://doi.org/10.1080/02702711.2010.528663

Lifelong Kindergarten. (2019). Scratch. Recuperado de https://scratch.mit.edu/about

Mairal Usón, R., Pérez Cabello de Alba, M. B., Teomiro García, I. I., Ruiz de Mendoza Ibáñez, F. J., & Peña Cervel, M. S. (2018). *Teorías lingüísticas*. Madrid: UNED.

Papadakis, S., Kalogiannakis, M., Orfanakis, V., & Zaranis, N. (2019). The appropriateness of scratch and app inventor as educational environments for teaching introductory programming in primary and secondary education. In *Early Childhood Development: Concepts, Methodologies, Tools, and Applications* (pp. 797–819). USA: IGI Global. DOI: 10.4018 / 978-1-5225-7507-8.ch039

Patterson, S. (2016). *Programming in the Primary Grades: Beyond the Hour of Code*. USA: Rowman & Littlefield.

Ringbom, H. (2006). *Cross-linguistic Similarity in Foreign Language Learning*. Bristol: Multilingual Matters

Ryu, D. (2013). Play to Learn, Learn to Play: Language Learning through Gaming Culture. *ReCALL*, *25*(2), 286-301. DOI: https://doi.org/10.1017/S0958344013000050

Schugurensky, D. (2000). The Forms of Informal Learning: Towards a Conceptualization of the Field. *NALL Working Papers*, *19*, 1-7.

Valentino, R. A., & Reardon, S. F. (2015). Effectiveness of Four Instructional Programs Designed to Serve English Learners: Variation by Ethnicity and Initial English Proficiency. *Educational Evaluation and Policy Analysis*, *37*(4), 612-637. DOI: https://doi.org/10.3102/0162373715573310

Viglioglia, M. T. (2014). Da Krashen A Porcher: Il Binomio Acquisizione/Apprendimento. *Science & Philosophy*, *2*(2), 55-64.

Weinreich, U. (1953). *Languages in Contact: Findings and Problems*. New York: Linguistic Circle of New York.

Zych, I., Ortega-Ruiz, R., & Marín-López, I. (2016). Cyberbullying: a systematic review of research, its prevalence and assessment issues in Spanish studies. *Psicología Educativa. Revista de los Psicólogos de Educación, 22*(1), 5-18. DOI: https://doi.org/10.1016/j.pse.2016.03.002