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# DigiCraft: A Pedagogical Innovative Proposal for the Development of the Digital Competence in Vulnerable Children

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**Abstract:** The integration of citizens in the society of information and knowledge is a pillar in social cohesiveness. The digital gap, a direct consequence of socioeconomic inequality among citizens enables e-exclusion, which is a new way of social exclusion that excludes people from different economic, social and economic backgrounds out of the society of information and knowledge. The aim of this paper is to present an educational programme lead by the Foundation Vodafone Spain with the assessment of educators and experts at university. The objective is focused on the development of the digital competence centred on vulnerable childhood. This program uses a method based on learning-by-doing and the “maker” movement. The majority of educators who have participated have underlined that children have improved their digital competence and also some transversal competencies and have defined it as an innovative and creative programme. DigiCraft contributes to the acquisition and development of digital competence from a social perspective. The proposal avoids discrimination of children depending on their sociable heterogeneous factors in their education.

**Keywords:** ICT; digital competence; pedagogical innovation; vulnerable childhood

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## 1. Introduction

The start of the Internet and its generalised use has produced a deep social change. In the new interconnected context, the Information and Communication Technologies (ICT) determines the ways of communication and socialization [1], life, study, work, entertaining, etc. [2]. In the world of mega change [3], the scientific and technological advances, as well as the economic and cultural globalization, originate a discrepancy in knowledge, furthermore, it provokes transformations in the cultural, economic and social structures, asking for a constant adaptation of citizens [4].

In the XXI century, the guidelines of social and economic development demand new social and digital competences in the citizenship, to develop their professional activity in an effective way contributing actively to the economic growth [5]. Thus, the European Union considers the introduction of the society of information and knowledge one of the pillars of cohesion. Thus the European policies promote the digital competence as one of the main skills of this century, besides considering technology as a key tool to favour possibilities of learningship and fight against exclusion caused by poverty [6] because they can play a relevant role to encourage a new method that mitigates and revokes the effects of existing development. The inclusion of the non-connected user to the digital world will be an opportunity to generate an ecosystem which takes advantage of all the potential of ICT [7] (p. 36).

In the so-called competences of the 21st Century [8], digital competence is considered fundamental to recover and process information, and for academic performance and professional success [9].

Digital competence is one of the eight key competencies for the 21st-century citizen [10] and is defined as:

The safe, critical and sensible use of digital technologies to learn at work and to participate in society, as well as interact with them. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), security (including digital well-being and cybersecurity-related skills), intellectual property issues, problem-solving and critical thinking [11] (p. 9).

The aim of this paper is to present an educational programme, called DigiCraft, whose aim is to focus on the development of digital competence among children from 6 to 12 years old, with a special focus on vulnerable childhood. It is an innovative pedagogical proposal lead by the Foundation of the Faculty of Education of the University of Salamanca (GITE-USAL).

To reduce the digital gap that causes e-exclusion is a major objective if we want ICT to contribute to the development of authentic societies of information and inclusive knowledge. Thus it constitutes a huge challenge in which it will be necessary to have close cooperation among institutions, international organizations, associations, the private sector, and civil society; to develop programmes of digital literacy that, from the early stages, contributes to e-inclusion. The new report of the Social Protection Committee of the European Union highlights that member States should continue pursuing their reform agendas, addressing also the gaps unveiled by the current crisis, and enhance the resilience of social protection systems, thus underpinning well-being and social cohesion in the longer-term [12].

The programme DigiCraft aims to improve abilities of Spanish children in the five areas of the digital competence established by the European Frame for Digital Competences (DigComp), with the purpose of minimising the digital gap. Therefore, its main aim is to improve globally the digital competence, integrating digital resources in learning activities.

In particular, it aims to develop search and information management strategies in children from 6 until 12 in different formats and criteria: to critically assess classified information; to get to know tools for cooperative learning; to improve online skills; to use in a responsible and ethical way the digital technology; to enable them to protect themselves from malware and bad users, etc.

The digital competence cannot be developed using basic models based on knowledge transmission; it requires that technology will be integrated into learning activities. Thus, the importance of the programme DigiCraft is set as it integrates ICT in very inspiring and rewarding activities for children, achieving complete training in digital competence. To form this competence in future users represent a key role in society and brings wellbeing and personal development in children.

## 2. Digital Gap

The lack of access to technology, as well as the different levels in which specific abilities are developed, generate new obvious risks which make worse, frequently, the situations of inequity and exclusion derived from the social, economic conditions of gender, age, etc., and deepen in the social and regional marginality not adapted to this model of development, both in different regions of the world and also in every person.

The concept of the digital gap appeared for the very first time in the US in the nineties and referred to social inequities which started to emerge when the computer and Internet use started to increase [13]. ICT is a reality not enclosed to the same term, not even to a phenomenon recognised in a unique way. It is also called technological gap, information and cognitive gap, digital division, digital poverty, inequality digital, among others [14].

Even though there are many definitions to this reality, the truth is that among all of them, one common element is shared: The technological and competence distance among those with Internet access and those who do not have Internet [15]. This situation does not deal with presence or absence

but with a grading, that means that the digital gap is different from one country to another or from one collectiveness to another [16].

To explain it, there are two discourses, that may be considered as the soft one and the hard one. Considering the former, it is understood that the problem is simply with regards to technology and its structures [17]. On the contrary, the hard discourse more realistically considers that the consequence of the economic and social inequity originates from the capitalist society, which separated the countries for its level of use of ICT. Both visions imply different ways to approach and sort the digital gap. In the first discourse, it is enough to make Internet access universal as the remedy to sort everything else. In the second, it becomes necessary to fight against social inequity, the root of the problem, because everything done from the technological point of view will benefit only a community, making these differences bigger. To a certain extent, it could be said that the digital gap is a direct consequence of the socioeconomic existing difference among countries, regions, institutions and people. It can be said, “that it is the reflection of the social gap in the digital world” [18] (p. 11).

In every historic age, there has been inequity in accessing technology which offers information and knowledge. There have always been communities which found accessing technology easier because of gender, age or social class [19]. However, the big problem we face nowadays is the fact that ICT has acquired a social meaning and its access becomes the reason of social exclusion, or e-exclusion, that is to say, that “separation or technological marginalisation, is becoming social and personal separation and marginalization” [20] (p. 161).

Thus, reducing this gap is “a priority given the fact that new technologies may contribute to the development of authentic societies of knowledge. The development in the information field does not depend on the economic mechanism but obeys to political decisions” [21] (p. 36).

To tackle this problem, the solution is to incorporate technologies and to also alphabetize digitally people who are able to use them in a safe and critical way of obtaining the maximum profit from them [16].

Different studies underline that one of the most significant gaps is related to cases of low digital competence [22–24]. In the report of UNICEF about children of the digital gap in Spain [25], it states that in this country, in which ICT access is commonly used, it is necessary to distinguish between children with no access and children with limited access because they lack adequate support for several reasons. It is calculated that about 13,000 children show a shortage of technology implemented in education. Moreover, social initiatives from the government to private institutions promote the use of ICT among the most vulnerable students regarding digital competence development [26].

### 3. E-Exclusion

Vulnerability, not only in terms of material shortage but from the psychological point of view, is a consequence of dynamic combinations of physical and environmental factors. Age, disability, illness, gender, the ethnic-cultural belonging, etc., are characteristics of users which may be more vulnerable depending on their relationship with other circumstances and, in particular, the economic, political, and social background which they belong to [27].

Vulnerable childhood is a social risk because they lack basic social needs and there is neither participation nor integration from the family [28].

Exclusion is a social phenomenon which has always existed in societies when people are victims of discrimination (work precariousness, long-term unemployment, poverty, changes in working conditions, lack or weakness in family and social nets, migration, stigmatised illness, ghettos, no access to education, etc.) which forces them out of the system and makes them live in marginalization, indigence, and poverty. In the Society of Information and Knowledge, the development of ICT has originated the start of new ways of social exclusion, due to various digital gaps which determine non-inclusive uses of technology [29].

The digital gap produces e-exclusion, which is a new way of social exclusion that allows people in different economic, socio-cultural and educational circumstances out of the Society of Information and Knowledge. Cabero and Córdoba used to express in 2009 when they wrote:

We intend to draw attention to the fact that if there are not enough measures, in a short-term future, the e-exclusion may become a fundamental pillar of social exclusion. This is because society has durations where it is structured based on digital nets and new technologies of information and communication [30] (pp. 71–72).

In the technological socio-information context, people must excel at digital competence in an advance-user way (to be able to connect and go on the Internet, search useful information, analyse it, remake it and share to others). Users need to be able to access culture and information nets. In addition, those who are not prepared, emotionally and intellectually, to use ICT will be more likely to end up out of the system and will have a more difficult time accessing the working market [31,32].

As a consequence, the majority of governments, institutions, and experts consider that digital competence is the best way to reduce the digital gap that generates e-exclusion [33] because it empowers people in all areas of their lives to search, find out, categorise and use the information and create knowledge in an effective way. This means they should be able to reach their personal, educational, social, and work goals as a basic right in a digital world to promote social inclusion in all nations [34].

With adequate digital literacy, e-inclusion will be achieved, as the assumption, application, and promotion of accessibility standards and guidelines through training and education [35–38]. Its purpose is to ensure that no one is left behind in using the benefits of ICT and focuses on the participation of all people and communities in all aspects of the Information and Knowledge Society, with the fundamental objective of reducing gaps in the use of ICTs and to promote their use to overcome e-exclusion and improve economic performance, employment opportunities, quality of life, participation, and social cohesion [39]. However, it should not be forgotten that e-inclusion supposes digital inclusion, not social inclusion, because the phenomenon of social exclusion is a more complex problem than that of e-exclusion [40].

#### 4. Why a Program Like DigiCraft?

In the annual monitoring report of the At Risk Of Poverty and/or Exclusion (AROPE) indicator in Spain and its autonomous communities, presented by the European Network for the Fight against Poverty and Social Exclusion [41], it is indicated that 26.1% of the Spanish population is at risk of poverty and/or social exclusion. These figures indicate that the reduction in poverty has been minimal and is currently only eight tenths below its historical maximum, located in 2014. Regarding the child population (under 18 years of age), the data shows that 29.5% are in AROPE situation, 26.8% live at risk of poverty, 6.5% endure severe material deprivation, 7.7% do so in severe poverty, and 7.7% live in households under employment accessibility.

In relation to ICT, though access to them is increasing, other gaps have become more obvious and are beginning to emerge in different approaches to digital competence [42–45].

In the last decades, Spanish educational administrations have been promoting the integration of ICT in schools and in teaching-learning strategies developed by teachers, following the guidelines of the European Union. Projects with the intention of integrating technology into classrooms once again demonstrate the political and social interest in the development of digital skills in schools. However, in non-formal education contexts, digital competence development policies have not been a focus of special interest. Hence the innovation of the training program presented in this paper.

The investigations carried out in this line shows that the use of new technological resources in curriculum development does not substantially change how the teachers proceed; innovation occurs at a technical level but does not have a significant impact on the didactic methodology. Students use technological devices frequently but not with enough skills in order to use technology optimally and effectively. In some cases, the introduction of ICT in the classroom, promoted by the Spanish educational community, far from providing new opportunities, is widening the digital divide among children, placing dropout rates at 18.3% [46], 80% above the European average. The current COVID 19 pandemic and its educational consequences have also highlighted these inequalities between families.

Bearing these concepts in mind, the Vodafone Spain Foundation began to develop in 2019 a digital literacy program, advised by the GITE-USAL group, with the intention of addressing a social problem, with the aim of training children and young people in digital skills that will be necessary for total social inclusion and focusses on the vulnerable childhood being affected by the digital gap which places them in a situation of e-exclusion determining their personal and professional future. With this vision and coordinating different groups of experts in education and technology, Fundación Vodafone Spain designs and promotes DigiCraft, a program that not only provides the participating centres with technological material but also makes available numerous educational resources with a clear goal: that all boys and girls have access to quality training in digital competence which contributes to e-inclusion in the Society of Information and Knowledge. ICT may change the situation for the most vulnerable children in Spain, helping them develop their skills towards social inclusion.

## 5. Methodology

The methodological focus followed in this work is the Design-Based Research (DBR), defined by Plom [47] as: The systematic study in order to design, develop, and evaluate educational interventions (such as programmes, strategies, or materials of teaching and learning, products and systems) as solutions to complex problems in educational practice and also its goals is the improvement of our knowledge about the characteristics of these interventions and the processes of design and development of them (p. 13).

Some authors refer to this type of research as “basic research based in regular use”, which constitutes essentially a different type of research from the traditional research not only in the traditional way but also in terms of its application [48,49]. This methodological design originated as a need to put into practice the results of the research and scientific development of the theoretical side, in both cases orientated to practical problem-solving.

This type of research seeks to find out if the pedagogical design of the educational innovations works according to its practical plan. It is focussed fundamentally on the didactic design and the way innovations contribute to a better comprehension of these didactic designs [50]. This comes from the need to apply the results of the research to the practice and development of the theory, with both of them focused on practical problem-solving, where they try to keep engaged with the theory and problem-solving of the real world.

Some authors [51–53], characterise this methodology as pragmatic; based on fundamentals; interactive and flexible; integrated; contextualised; focussed on processes, cooperative, interventionist, multilevel and orientated to usefulness and based on theory. In addition, it may appear as an unfinished, not concluded, or open theory.

Accordingly, it is important to indicate that this paper does not introduce either empiric or quantitative research that is orientated on generalising results. Instead, this paper focuses on the generalization of results which aim to acknowledge implications about practice, whose emphasis is problem-solving and knowledge building from the design and implementation of an educational programme [54–56].

The goal of this article is to explain and analyse an innovative project designed by experts of digital technologies and educators for children in a situation of e-exclusion, a programme which has been implemented in several schools in Spain, in which educators related to Non-Governmental Organizations (NGOs), such as Cruz Roja and Save the Children, and some schools. The programme is online and can be used by several educators all over the world. The objectives the design and some data will be explained in the next section, in order to get to know the strengths of the programme.

## 6. Results

DigiCraft is an educational innovative programme led by the Foundation Vodafone Spain and with the advice of educators of the Educational Technology Research and Innovation Group of the University of Salamanca (GITE-USAL), with a wide trajectory in the education sector and the technology regarding education which certifies the educational proposal of this programme. The work of this group, integrated by educators is based on: design of the methodology DigiCraft, design of the competences and pedagogical aspect of the programme; design and validate of the activities of various itineraries: design of the evaluation process and creation of the tools and surveys to collect information.

This educational national programme should last a minimum of 4 years. It is being carried out in cooperation with non-governmental organizations (Cruz Roja, and Save the Children, Madrid, Spain) which are developing programmes of educational reinforcement in extracurricular times in collectiveness of vulnerable children and public entities (Xunta de Galicia, Comunidad de Madrid y Junta de Andalucía) through special announcements in schools financed by state funds in Primary Education.

Considering the importance of digital skills for inclusion, DigiCraft focuses its interest on promoting the level of digital competence in childhood; involving and training educators in the development of this type of competencies; analyzing the elements that generate these learning processes and their implications in the acquisition of these capacities by the recipients (<https://digicraft.fundacionvodafone.es/>).

The results of this work present the didactic design of the educational innovation, the process explained as follows.

### 6.1. Didactic Design of DigiCraft

#### 6.1.1. Goals

For the didactic design of DigiCraft, the European Framework of Digital Competences for Citizens (DigComp 2.1) [57] has been set. It structures digital competence in five areas (information and information literacy; communication and collaboration; creation of digital content; security; problem-solving), four levels with two sub-levels each level (basic, intermediate, advanced, highly specialized) and three areas (knowledge, ability, attitude). Taking into account this framework, the objectives determined for each established age group (6–8 years and 9–12 years) were proposed.

The main goals of this programme are:

- To reduce the digital gap and attract technological professionals by means of a new methodology which combines the digital and traditional world to set academic itineraries and training activities which motivates their interest in the technology and digital world.
- To train children between the ages of 6 and 12 in digital competences which allow them to lead their future, considering that these competencies go beyond the use of a new digital device or ultimate technology. This transversal key competence is equivalent to the safe and critical use of digital technology and widens the knowledge, the capabilities and attitudes needed by all citizens in a digital society in continuous transformation.
- To involve families and schools as they play a fundamental role as facilitators, partners and leadership guides; besides implying the development of the digital capabilities at home and during lessons.

#### 6.1.2. Structure

In the elaboration and development of the programme, two options have been established: one “open” accessible to all users interested in the programme with activities addressed to three communities: children, families and educators (maybe consulted in <https://digicraft.fundacionvodafone.es/actividades>); and a specific “presential” for the communities

of vulnerable childhood who attend programmes of school reinforcement and for students. Both are linked as they have a common methodology called DigiCraft.

Regarding the option “presential”, addressed to children between 6 and 12 years, it is justified because there exists a clear need for teaching specific training in the digital world for children, to guarantee the quality of opportunities in the future. In Spain, several non-governmental entities have programmes of educational reinforcement for young students in a situation of vulnerability. This makes it necessary to work the digital competence with regards to public administrations, that competence is part of the curricular activity of schools.

DigiCraft is inserted among the reinforcement programmes which are working as part of the daily basis in schools, investing part of the weekly hours of young students in their training in abilities and digital competences. Two fundamental previous needs have been identified: the training of educators and teachers who will develop the programme and the provision of technological material in the centres being in the programme.

### 6.1.3. DigiCraft Methodology

One of the key factors has been the creation of a specific technology which innovatively implements abilities and digital competence, by means of educational and joyful activities which do not require digital devices, combining both digital and analogical activities. The singularity of this methodology is that it is achievable by all, which uses learning models based on the design of thinking [58], experimentation [59] and gaming, using tools such as table games, grouping dynamics, low-cost experiences using recycled, printable or hand-made materials, etc.

The use of physical materials help control stress and improves concentration. In this sense, this methodology focusses in learning through doing, discovering and creating new things through experience and exploration, generating safety surrounding of trial and error to promote learning. On the other hand, the use of games is a facilitator in the development of social skills, improving concentration, complex thinking and strategic planning, showing that, when learning, it increases motivation towards learning, helping to internalize multidisciplinary knowledge, promoting logical and critical thinking and improving problem-solving and decision-making skills. Thus, the game is one of the key pieces of this methodology, providing a stimulating and beneficial educational framework in the development of competences associated with digital skills.

Material resources used for the development of this methodology are high-quality materials at a low cost, permitting them to be accessible to all type of addressees no matter their economic status. This is a necessary requirement which guarantees the programme success, given the fact that for every type of children collectiveness in which the programme is focussed, the final users do not have access to digital devices such as computers or tablets, or even unlimited Internet.

To summarise, DigiCraft is set into four fundamental pedagogical pillars: the game as a motivating element, the experimentation to discover creating, the combination of the physical and virtual world, and the adaptation of the digital competence at every age. With the end goal of stimulating the curiosity, creativeness and the positive emotional development, favouring the acquisition of digital competence in an amusing way through several emerging technologies (virtual reality, educational robotics, artificial intelligence, videogames). The programme is organised in different training itineraries which strengthen the respect for the environment, promoting recycling and responsible use of technology, setting activities which combine the use of electronic devices with the development of motor and cognitive abilities, logical thinking and collaborative work in a joyful environment.

### 6.1.4. Phases in the Design of Programme DigiCraft

To design the programme, there are six phases:

## PHASE 1. Definitions of Areas and Objectives

Firstly, areas and digital competences are analysed and defined to work with children, regarding the agreement with the European Frame of Digital Competences for citizens (DigComp 2.1) [57]. Specific objectives were established to reach every age group (6–8 years, 9–12 years) and the itineraries were defined in relation to the established competences.

## PHASE 2. Design of the Methodology DigiCraft

Before the design of the methodology, several working groups were established for an exchange of information, in which educators, social workers and experts in design and technological elements were allowed to know the scenery and the real context in which the methodology was designed, along with material resources and the online platform of the programme. As a result of this work, educators from the Group of Investigation and Educational Technology of the University of Salamanca (GITE-USAL) designed the methodology.

In this phase, an explanatory guide for this methodology was elaborated through the web platform. In this, it is explained in a detailed way with an accessible use of languages for everyone, consisting on the methodology to spread DigiCraft, their benefits, the itineraries formed by them, the competence to work within every one, and the pedagogical fundamentals (Figure 1), among other details (<https://digicraft.fundacionvodafone.es/metodologia>).

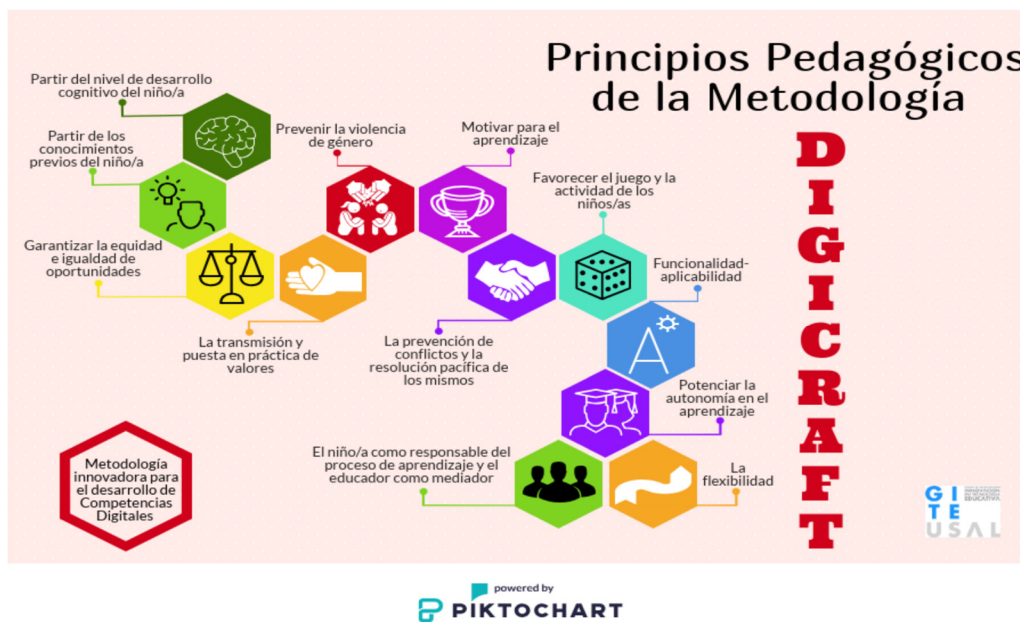


Figure 1. Pedagogical foundations of the DigiCraft methodology.

## PHASE 3. Design of the Itineraries

In “presential”, four itineraries were designed, two for every age group (9–12, 6–8), which lasted 14 h for itinerary) considering that the activity will be developed one hour a week during the whole school period of 28 weeks in the reinforcement centres and the educational centres). In every session of the activity, several digital skills are trained.

Every educational itinerary is developed through different types of activities called “crafty” with regards to the DigiCraft methodology, which are combined with the use of DigiCraft kits which contain technological specific elements based on the selected technology for every itinerary. “Crafty” is the name of a type of activity to work digital competences in a creative way, without the use of technological devices (table games, grouping, interior and external games, art and crafts, etc). These activities follow a sequence determined in the methodology and are developed under the premises



of (1) educational components using gamification; (2) requiring printable materials to work; (3) investigating the motor activity and not the intellectual one.

The sequence of “crafty” activities is used for the four itineraries which allow the progressive learning of the competences, indicating in every one of the sessions: type of activity, objectives, digital competences to develop. The sequence must cover 14 h, considering that there must be “crafty” activities and kit activities.

To design itineraries, adequate technologies have been selected and justified scientifically in which two types of the DigiCraft kit have made (each one with a different technology), the necessary material in order to allow different age groups working in the same kit doing different activities. The technologies selected for this have been videogames and augmented reality (first itinerary for ages of 6–8 and 9–12), educational robotics and artificial intelligence (second itinerary for each age group).

#### PHASE 4. Design of Didactic Guides for “Crafty” Activities

These guides serve as a guideline for the group of educators and explain, in detail and with accessible language, what the activity is; how to put it into practice; what digital skills and objectives are to be achieved; its timing; materials needed, how to evaluate the results, etc. The specific requirements for the development of “crafty” activities are set out in the sequence of each itinerary.

This phase also specifies the general requirements for the design and production of DigiCraft kits: general and specific objectives, skills to work. The kit needs to be the culmination of the training itinerary, so its design has to be consistent with the methodology and the sequence of previous activities.

#### PHASE 5. Establishment of Validation Criteria of the Activities, Materials, Kits and Didactic Guides of the Presential Parts Generated in Every Itinerary

It is focused on the adequation of the defined specifications and the methodology DigiCraft, with regards to the previous process. The general requirements are determined on how to set any activity to be considered “activity DigiCraft”.

#### PHASE 6. Evaluation of the Programme and the Results about the Development of the Digital Competence

An evaluation methodology is designed and instruments are developed for the evaluation of the acquisition of digital competence, in addition, define the sampling process and the procedure for data treatment.

The evaluation of digital competence is carried out by means of two instruments according to each age group (9–12 years old, 6–8 years old). This has two moments (pre-test: before starting the program and post-test: once it is finished) and it is done through an app designed specifically for this purpose that can be installed on a tablet or mobile. The application simulates a story in which children under 18 put themselves in the shoes of three characters and they have to answer a series of questions to get a reward.

At the moment, there has not been a deep evaluation of the programme, that is why we cannot present any results of the learningship of the students. Educational parameters have been settled in order to evaluate this process.

This evaluation will be educational and additional, with the intention to provide information to children and educators, and to evaluate the effectiveness and quality of the didactic proposal.

This process aims to cover all the components of the digital competence: knowledge, abilities, attitudes and values for the use of digital resources. Taking into account the base of the European Frame of Digital Competences (DigComp), used for the design of the programme, the acquisition of the competencies in these five areas will be checked as they are proposed in this model (information and informational literacy, communication and cooperation, creation of digital contents, cybersecurity and problem solving).

It is key to quantify some results so that we can establish learning levels and comparisons among the population, but it is important to express their opinions. The evaluation will be settled as a game, following the idea of “learning gaming”. It will aim to provide positive feedback to students about their learning process, helping them be aware of their development in their digital competence.

Thus, two different evaluation tests have been created with regards to the child’s age. There are challenges or similar problems to the ones used during the development of the programme. The answers are found by a small group of independent students, with regards to the way they usually worked in the programme and with a short deadline. Every student has to choose a character among several characters of the programme and answer five challenges associated with the chosen character. Every group will have their final feedback with the answers following the level of achievement.

## 6.2. Some Data and Results of the Impact DigiCraft

This program has been implemented during the academic year 2019–2020. So far, the main results are the following.

Hand in hand with the Non-Governmental Organizations of the Cruz Roja Juventud and Save the Children, it has been developed in seven Spanish provinces (A Coruña, Alicante, Ciudad Real, Madrid, Malaga, Murcia and Seville), with a total participation of 1384 children and 175 educators.

Regarding the provision of materials, 348 tablets, 166 kits with different materials related to the technology used (virtual reality, educational robotics, artificial intelligence, video games) and 37 printers have been made available to users.

On the other hand, the program inserted within the curricular activity of educational centres has been piloted in 50 centres financed with Galician public funds with the collaboration of the Xunta de Galicia, in which 3813 children and 239 teachers have participated, of which 100 have received direct training and 139 are collaborating teachers.

Regarding the assessment of the educators who have participated, the main opinions collected through an online satisfaction survey are summarized in:

- More than half (86.6%) say that DigiCraft has provided them with innovative digital educational tools and resources that have allowed them to work with children from a different, active and motivating perspective.
- The majority underline that children have improved their digital competences, especially those about “the knowledge of different technologies and evaluation of the information on the Internet” (63.5%), and the “search and evaluation of the information on the Internet”. It has also been indicated that children have learnt in the “protection of devices and health regarding the use of technology” (40.4%), “the development of digital contents and basic programming” (36.5%), and less in “branding and digital identity setting” (17.3%).
- Likewise, it is mentioned the development of some transversal competencies such as “creativity” (94.2%), “teamwork and interpersonal social abilities” (78.8%), and “speech and writing skills” (50%) have been developed. To a lesser extent, it is also underlined “decision making” (34.6%) y “leadership and negotiation abilities” (26.9%).
- Finally, if they could say in a word what DigiCraft has implemented in their schools not only for educators but for the whole school community, innovation and creativity are the key terms (Figure 2).



Figure 2. Word brainstorm according to the concept of DigiCraft.

## 7. Conclusions

The DigiCraft programme, that challenges the education of children between 6 and 12 years in digital abilities and their associated basic competences, is original, creative, and innovative.

Though there are innovative technological and advanced solutions for the development of the digital competence (promoted or with licences of several corporations such as Lego Education, Bmaker, Google for education, Samsung Smart Schools, creative schools of Telefónica, among others), none of them has the requirements of the programme due to:

- DigiCraft not only promotes the use of technological hardware, but it combines it with material which allows developing different abilities such as motricity, space vision, teamwork, etc. According to the educational net Tiching [60], to combine analogical and digital resources enriches the educational process because every resource allows students to work in a different way the same competence.
- Unlike the rest of the solutions focused on schools, the programme is based on classes of school reinforcement focused on vulnerable childhood. Likewise, the methodology is adapted to times, student profiles and educators and the working conditions on the mentioned classes.
- The majority of the solutions are based on ad hoc workshops and activities with a limited time, whereas DigiCraft sets a training itinerary which lasts a whole academic year.
- One of the fundamental pillars of its methodology is that the activities have a solid ludic component. Different studies have verified the positive effects of gaming in the learning and development of competences [61–63].

The activities generated from this programme will allow better acquisition and reinforcement of the digital competence within harmed collectiveness, one of the eight key competences defined by the European Union. Likewise, an important support and reinforcement programme is generated, available for the humanitarian organizations and people who require it.

DigiCraft contributes to the acquisition and development of the digital competence integrating the social perspective, promotion an intervention programme and improvement of e-inclusion of people in processes of digital citizenship, which will have an economic and social impact, contributing to equality of opportunities and sustainable development.

The programme, besides having social consequences avoiding digital gaps in determining collectiveness, has implications in the Sciences of Education for the educational practice. The didactic principles which support this project may adopt different types of proposals aiming to join the learningship based on experience, technology and science, with the development of the art and craft competences.

It focusses on learning through experience and exploration, creating safe environments of trial and error which encourages motivation, creativity and critical thinking. These cognitive processes will help children develop more experienced learnings, easier to remember and at a deeper level [64,65].

By using the game and providing a stimulating educational context, the development of competencies associated with digital abilities is granted. In addition, the motivation towards learning

is increased, helping develop multitasking knowledge, and fostering logical and critical thinking by means of problem-solving management and decision making [66].

It is a programme which contributes to resources and high-quality didactic materials, adapted to different ages and all types of people, no matter their social or economic status. This is an essential requirement that guarantees the success of the project, as it is focused on vulnerable childhood. The final users do not have information about the majority of students with access to digital devices such as computers or tablets, or even Internet access.

DigiCraft favours the use of technological hardware combined with analogical materials which allow to development of abilities such as mobility, spatial orientation, teamwork, etc.

Although its development is being extended to public institutions in several Spanish autonomous communities, it is carried out mainly in educational reinforcement classrooms. In this way, the methodology is adapted to the times, the profiles of students and professionals and the working conditions in these classrooms. Unlike other action proposals, DigiCraft proposes a training itinerary that covers the entire school year.

To summarise, this study aims to contribute to the research about acquisition and development of the digital competence, announcing an educational programme that promotes e-inclusion of all people in the processes of digital literacy in children and citizens. Thus, it will contribute to the economic and social development as well as giving the same level of opportunities to students by minimising the digital gap.

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