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Lights and shadows in the e-communication of Galician pre-teens

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***Title*— Lights and shadows in the e-communication of Galician pre-teens**

***Abstract*— This article aims to analyze and understand the ICT-based communication of Galician pre-teens; their knowledge and attitudes in the area of communication and collaboration in the framework of digital competence (DC), especially in relation to interaction, netiquette and digital identity. For this, a mixed methodology is used – a multiple case study and a DC evaluation – taking the DigComp model as reference. The results show that there are competence gaps, difficulty in terms of transferring learnings between contexts, gender-based differences in habits and capacities and an important role played by families in the whole process.**

***Index Terms*— Digital competence, teenagers, compulsory education, communication, collaboration.**

I. INTRODUCTION

Information and communication technologies (ICTs) have become integrated into our lives, are a part of them and are necessary in all the spheres of our daily routine. Unquestionably, this includes also pre-teens' daily lives, all the more so today, in a general context of online education due to a virus that has turned our lives upside down. The generations of the past two decades have been described as digital natives [1], an expression that later led to a plethora of terms to refer to them, such as millennials, Generation Z or Generation T, to name just a few [2]. However, multiple research studies have questioned these claims [3], [4]. In the current situation generated by the pandemic, and with the online education model that it has imposed at all educational levels, we are beginning to see how certain practices, knowledge and skills that were previously taken for granted are not as expected, and we are now noticing how scarce the digital competence of some young people is, or how large the digital gap, as the press has pointed out in the past months.

The capacity to communicate, interact with others, share resources and do all this while respecting certain rules has become an essential component of this competence. Accordingly, it is particularly relevant to make an effort to closely examine how digital competence is put into practice by our young people, what are their limitations and strengths and in what contexts and circumstances they develop such competence.

II. DIGITAL COMPETENCE AND ITS DIMENSIONS

For the past fifteen years, digital competence (DC) has been studied and dealt with by multiple authors [5], [6] who have also shown how this concept has evolved over time [7]. This construct is closely linked to other constructs associated with it, such as media literacy, digital literacy and digital skills [8], which tackle common elements from other perspectives.

This work takes the conceptualization suggested by Ferrari [9] within the DigComp project as reference. In this project, DG is understood as a set of knowledge, skills, strategies, attitudes and values that are put into action when we use digital technologies and media [9]. This conceptual proposal of DC is organized into five areas: information and information literacy, communication and collaboration, digital content creation, safety and problem solving. In turn, these are subdivided into more specific units of action, allowing us to itemize certain elements that are considered to be critical in DC.

A number of research studies focusing on the DC of the youngest generations point to vast differences in the level of DC attained in this age group, even in the same school or classroom, and emphasize the important role of the school as a space for the teaching of DC [10]. Other studies have shown how students' motivation and the role played by their family backgrounds (such as the number of books at home or their parents' education) eventually became predictors of their level of DC [11]. In this regard, several studies insist that one of the fundamental challenges in the field of education is to measure and diagnose DC in primary and secondary students [12]. This challenge is tackled in the project "Competencia digital en estudiantes de educación obligatoria. Entornos socio-familiares, procesos de apropiación y propuestas de e-inclusión" ("Digital competence in compulsory education students. Social and family environments, appropriation processes

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and e-inclusion proposals", CDEPI), which sought to identify, analyze, understand and assess the DC that compulsory education students have and use in their daily lives, and its relationship with social inclusion processes. This study was carried out in the autonomous communities of Galicia, Castile and León, and Madrid. In this article, we will focus on some of the results obtained in Galicia.

III. COMMUNICATION AND COLLABORATION IN THE SPOTLIGHT

In this article, we will focus our attention on one of the areas of DC, communication and collaboration, since this is one of the key elements in DC owing to the critical role played by virtual tools in the communication of the youngest generations [13], who can no longer understand life without this form of interaction [14]. Along this line, "Together but Separate" [15] is one of the research studies that deal with the social loneliness and the virtual friendship that are felt by many teenagers who are permanently connected. Other studies have also analyzed the positive and negative aspects of virtual communication among the youngest generations [14] or put the focus on what teenagers do when they connect to the Internet. These studies highlight that more than 58% of them use social networks [16] and 89% of teenagers use at least one social network and have a profile on it [17]. In this direction, several research studies have already dealt with the changes in social communication [18] in a society in which people have increasingly earlier access to mobile phones: 66% of Spanish minors aged 10 to 15 years have a mobile phone, according to a survey of the Instituto Nacional de Estadística (National Institute of Statistics) [19].

As a result of the massive presence of the Internet at home and in schools, hyperconnectivity has become normal for most young people [20], who stay in touch through communication tools and collaborative environments. This constitutes what Jenkins [21] called participatory culture more than one decade ago, highlighting that it is not only about being present in these spaces but about playing an important role in them. In this direction, we wonder what happens to students when they are about to reach the secondary education level. Are they still consumers of information? Do they become prosumers [22] or, as some are now describing, collaborative creators [23] through tools in which they play a major role, including YouTube, Facebook, Instagram and TikTok [24]? These tools interfere with their school performance and their lives, causing even context collapse, in which identities such as academic identity and personal identities intertwine [25].

Such hyperconnectivity and young people's daily presence on the web is critical in the configuration of their digital identities, which, as recent studies have shown, in many cases eventually intermingle with their offline identities [25]. These are teenagers who seek to be socially positioned in a space marked by likes, followers and online reputation [26].

In this context, this article intends to understand minors' communicative practices through ICTs and find out about their skills, knowledge and attitudes in relation to this area of DC, as well as describe the level attained by students in the six subcompetences (Table 1), which deal with the following: the way of communicating in digital environments, the way of sharing resources through online tools, how students connect and collaborate with others through digital tools, how they interact in communities and/or citizen participation networks, what rules or codes they use in online communication and, lastly, how they create relational spaces that mould and shape their digital identities [27].

Table 1. Subcompetences in the area of communication and collaboration described in the DigComp project

Area	Subcompetences
Communication and collaboration	Interacting through digital technologies
	Sharing information and content
	Engaging in citizenship through digital technologies
	Collaborating through digital technologies
	Netiquette
	Managing digital identity

Lastly, we seek to look at three of these subcompetences in greater detail: interaction, netiquette and digital identity, owing to the special significance that they take on in adolescence. Indeed, they are central matters of constant concern to families and schools, and the use of such elements will have consequences for teenagers' future [28]. For the three objectives of this article, we will analyze potential gender-based differences.

Pre-teens communicate and interact through photos, texts, videos and likes, which are shared with their friends and exist in a medium different from their "face-to-face" networks. In this way, pre-teens build their "virtual selves". This is how they shape their digital fingerprints, which they begin creating at an early age and are hard to erase later [29]. All this complex process takes place in different households, with norms and rules formed in the family environment which usually lead to technology-related tensions between teenagers and their families [30] and different ways of using social spaces and communication according to one's gender [31].

IV. METHODOLOGY

A. Design

In this study (carried out in the autonomous community of Galicia) we opted for a mixed design with an initial qualitative phase and a second quantitative phase, both of which were of similar importance. Following Creswell and Plano Clark's classification [32], the design employed can be placed within those called sequential exploratory designs, which are those whose first part uses a qualitative method, the results of which are necessary to carry out the second phase (see Fig. 1).

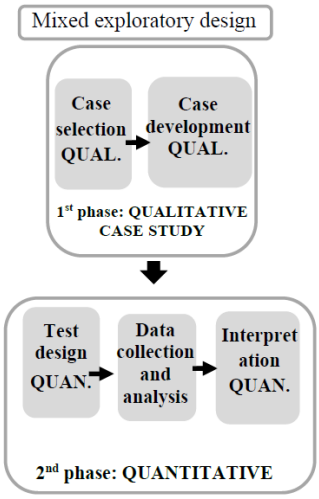

Fig. 1. Design and phases of the research study

B. Qualitative phase: multiple case study

The qualitative phase took shape as an instrumental multiple case study [33], with which we sought a better understanding of the matter under study. The participants included eight Galician pre-teens (six for the CDEPI research project and another two for a subsequent research phase) from families of different socioeconomic levels. These pre-teens were identified with fictitious names: two girls who were twin sisters (Catarina and Lucía) and one boy (Pedro) from a high socioeconomic and cultural stratum; two identical twin brothers (Alfonso and Antón) and one girl (Elisa) from a medium socioeconomic stratum and, lastly, two boys from a low socioeconomic and cultural background (Jaime and Bieito). The selection of these pre-teens was based on the results of a questionnaire in which students from several Galician public schools participated.

Different data collection techniques were employed during the conduct of the study. In this article, we will focus on the results obtained through semi-structured interviews with the case subjects, their parents and the school tutor, and from the participant observation of the minors during the interviews. During that time, the minors did their schoolwork or played with different apps on their tablets or laptops, which was recorded on video.

The data analysis was carried out using the program ATLAS.ti 7. An initial deductive-inductive coding approach was applied to the data from each case, since not only the baseline theoretical framework was taken into account, but also those categories that emerged from the data. The analysis of each case was carried out by two investigators in order to ensure the reliability of the analysis. In a second phase, an association was established between the categories and subcategories that had emerged, in an attempt to find keys in the text that would enable a correlation between them, in order to obtain a deeper understanding of the matter under study.

C. Quantitative phase: DC assessment

This phase resulted in the design of a DC assessment test and its application to 6th-grade primary students in Galicia, as described below.

- **Population and sample**

For the selection of the participants, we opted for a stratified sampling approach with proportional allocation based on the number of 6th-grade primary students from public schools in each of the strata, which were shaped on the basis of three variables: province where the school attended by the minor was based (Atlantic or non-Atlantic), population density of the municipality where the school was located (low, medium or high population density) and, lastly, whether or not the school was included in the technological immersion programme of the autonomous community of Galicia, E-Dixgal.

A total of 602 students participated in the test for the area of communication: 48.7% were boys and 51.3% were girls. Also, 40% of them were attending schools that were part of the E-Dixgal technological immersion programme, and 60% were not. With regard to their location, 43.4% were in municipalities with a high population density, 35.4% in municipalities with a medium population density and 21.2% in municipalities with a low population density.

- **Tool**

For measuring and assessing DC, including the area of communication, the GITE research group from the Universidad de Salamanca (in charge of one of the coordinated projects) designed a test (ECODIES) based on the DigComp model, bearing in mind also a number of indicators that had resulted from the case studies conducted during the initial research phase. To this end, the investigators previously defined a system of indicators that was validated by a group of experts.

Specifically, an initial model comprising 356 indicators distributed across the five areas of DC was proposed. A total of 77 experts, assigned to the different areas, evaluated these indicators according to the criteria of importance, relevance and clarity, using a four-level Likert scale. These judges were selected according to three criteria: they had to be experts in evaluation, or in digital competence, or have experience in primary and secondary education [34].

The degree of agreement among the judges was calculated using the content validity index, following Lawshe's model [35] and Tristán-López's revision [36]. Once the validated indicators had been selected, the assessment test was built and subsequently improved after a pilot application was carried out in the year 2017-18. The final version of the test comprises 108 items, which refer to knowledge, capacities and attitudes. Among these items, a total of 24 make up the part of the test that deals with the area of communication, and are organized into the six subscales included in the aforementioned model, as well as into a set of attitudinal items (see Table 2). The reliability of the test with regard to this area is 0.73 (Cronbach's alpha).

Table 2. Items of the test and subcompetences of the area of communication and collaboration

Subcompetences	Knowledge and capacities	Attitudes	Total
2.1. Interacting through digital technologies	3		
2.2. Sharing information and content	3		
2.3. Engaging in citizenship through digital technologies	3	6	24
2.4. Collaborating through digital technologies	3		
2.5. Netiquette	3		
2.6. Managing digital identity	3		
Total items	18	6	

The scores for each subject in each area were calculated by adding up the number of correct answers for the knowledge and capacity items and for the attitudinal questions, after dichotomizing the latter, which had initially been measured on a 1 to 5 scale. Therefore, a direct score in knowledge and capacities, another one in attitudes in each area, and a final direct score by area, which is the result of adding up the first two scores, were obtained for each student. In this study, both the final score in each area of competence and the score in knowledge and capacities and that pertaining to attitudes in the area of communication and collaboration were normalized to 10 in order to facilitate their interpretation and comparison. This was also done for the scores obtained for each subcompetence of the area.

Also, with a view to explaining the potential relationship between different personal and family conditions and the level of competences, a questionnaire was designed and applied in order to collect information about the subjects' sociodemographic variables, patterns of use of ICTs and other potential indicators of their families' socioeconomic and cultural level. The data were collected throughout the year 2018-19.

- **Data analysis**

Statistical package SPSS version 25 was used for the analysis of the data from the test and the questionnaire. Univariate descriptive analyses (percentages, measures of central tendency and measures of dispersion) as well as parametric tests for the difference in means (Student's *t*) were carried out.

V. Results

The study that we carried out allowed us to get a picture of minors' communicative practices through ICTs, find out in what circumstances and contexts and with what tools and purposes minors engage in such practices, and know the level of development of this area of DC, which begins to have a significant weight at this age, when communication with their peers is a fundamental motivation for the use of technologies [14], [16], [21].

Also, the application of the DC assessment test in a large sample of 6th-grade students enabled us to know the students' level of competence at the time when they finish primary school, as well as their scores in the different areas of the DigComp model.

Through these two methodologies, we were also able to approach the different subcompetences in this area, especially interaction, digital identity and netiquette, and the potential differences between girls and boys in terms of both the level they reach and the practices they acquire, which already appeared as a prominent element in other research studies [37].

A. The area of communication and collaboration: level of development

The results of the test reveal that Galician students have a medium level of DC, with an average score of 6 points (X = 6; S = 1.3) on a 10-point scale. If we make a comparison of the five areas that make up DC (see Fig. 2), we observe that the area of communication and collaboration is the second most developed, with an average of 6.34 points (S = 1.65), preceded by the area of safety (X = 6.55; S = 1.78). However, in spite of this optimal situation relative to the rest of areas, students' level of competence is not defined as high, as it is barely above six points on average and 19.4% of students do not reach five points in this area.

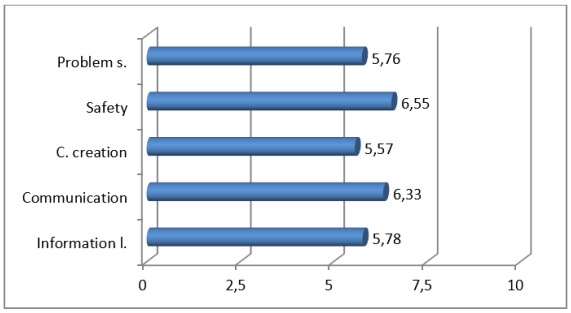

Fig. 2. Students' average scores in DC areas

Pre-teens obtain, on average, better scores in attitudes that relate to communication and collaboration than in knowledge and capacities. For the former, the average is 8.41 (S = 2.15) versus 5.45 (S = 1.85) for the latter, showing a difference of almost three points.

If we take a close look at the six attitudinal items that were presented in the test, the percentage of subjects that positioned themselves in the "Agree" or "Strongly agree" options (on a 5-option scale) exceeds 75% for all items, which reveals that most subjects have a high attitudinal level, i.e., students show a good tendency to maintain types of behaviour deemed appropriate in communicative processes that take place through ICTs, avoiding any risky behaviour and weighing up their actions before carrying them out. However, their knowledge in this area of competence can only be given a bare pass, and 33% of students do not even achieve that mark. Those who obtain a substantially high mark (above 8) represent 11.6% of students.

This study shows that pre-teen girls have a better command of the area of communication and collaboration than their peers (including both boys and girls), regardless of whether we evaluate the whole of the test (the average mark being 6.58 for girls versus 6.11 for boys; $t = –3.4$; $p = 0.001$) or focus our attention on knowledge and capacities (5.68 versus 5.24; $t = –2.82$; $p = 0.005$) or attitudes ($t = –2{,}98$; $p = 0.003$), with an average of 8.68 versus 8.15 for boys. These results are in line with other studies that have conducted an in-depth examination of gender-based differences in certain technological abilities [37]. If we look at this situation closely using the cases analyzed here, they demonstrate an unequal development of this area of competence.

B. The subcompetences of the area of communication and collaboration

The analysis of the different subcompetences that constitute the area of communication and collaboration reveal that pre-teens obtain their best scores in netiquette, the only subcompetence in which they reach more than six points on average. Digital identity follows at a certain distance with the second highest score. Collaboration is the only subcompetence in which students do not reach a score of five points, and the three remaining subcompetences receive an average of approximately five points within the whole of the sample (see Fig. 3).

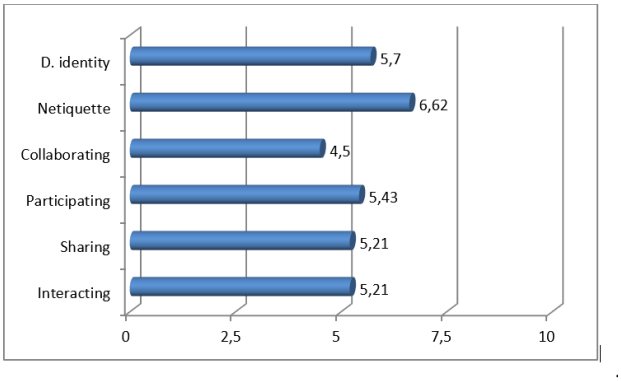

Fig. 3. Students' average score in the subcompetences of the area of communication and collaboration

- **Interaction**

The first subcompetence in this area refers to the capacity to interact through a variety of digital devices and applications, to the appropriate use of different forms of communication and to the adaptation of strategies to the specific audience. If we analyze the responses given to the items that make up this subarea, we see that 43% of the minors have difficulty adapting their mode of communication to the means employed. For example, these young people indicate in one of the items that they write their messages entirely in capital letters so that they will be better understood, or that they communicate in their written messages in the same way that they speak.

A clear difference can be seen between boys and girls in this subcompetence. Boys obtain an average of 4.87 versus 5.59 for girls ($t = –2.95$; $p = 0.003$). There are some gender-based differences in the forms of interaction they implement and the type of tools they use, as previous research studies had already shown [38]. Among male students, the type of communicative exchange that prevails is that whose epicentre lies in video games, a space in which students interact with other peers. This situation is often reflected in the cases analyzed. Antón and Alfonso put video games in the centre of their interest, and it is through video games that they develop much of their communicative competence. As for Jaime, he is an expert in video game consoles, which he has played from a young age and through which he engages in communication with other players. Online games allow them to chat with other playmates, as a result of which these games become a common means of communication for them. Often, this communicative route also facilitates a permanent connexion with their classmates.

Antón and Alfonso's mother: "Yes, they use many of the games to chat, so, of course, they're in constant communication with their friends."

In many cases, these interactions also force them to switch languages in order to communicate with other users or get to know other cultures as a consequence of their playing online with subjects of other nationalities, as in the case of Jaime, which his mother highlights as valuable.

Jaime's mother: "Then there are other times when he plays … That's why he plays online, I tell you. With children from other countries … Sure, and then, for example, he'd tell me, 'Mom, I met a Mexican child and he told me things are like this and like that in his country.'"

Likewise, Alfonso and Antón have taken the opportunity provided by video games to practise other languages, adapting to the situation in order to continue with those interactions. That course of action is not always followed, as in the case of Jaime, who refuses to engage with those "he does not understand."

Alfonso: "But as I have a The Walking Dead *account,* The Walking Dead *followed me, the guys from* The Walking Dead*, so I'd speak to some of them through private messages … And since they spoke in English I had to speak in English …"*

In this sense, Jaime makes a lot of use of video game consoles to communicate with his virtual friends and unknown users: they send friend requests to each other, invite each other to participate in groups, let each other know so that they will go online and play, discuss video games and help each other get past stages, taking part in the participatory culture he mentioned [25].

Pedro is an avid gamer and also a regular user of YouTube. This is another online communication activity that stems from his passion for *Clash of Clans* and *Clash Royale*, which have an embedded chatroom for players to communicate with the members of their clan.

In the case of girls, on the contrary, instant messaging is what they use most often, as the cases studied here show. The instant messaging tools used by pre-teen girls include WhatsApp (on their fathers' or mothers' mobiles, which makes it possible to control their interactions and the duration of use) but also others such as Hangouts or Instagram.

For Elisa, the main appeal of ICTs lies precisely in the possibility to communicate with her peers using different tools. She has accounts on WhatsApp, Hangouts (Gmail),

Instagram, Snapchat and TikTok, although she only uses Instagram as social network. The relevance of the first of these tools to Elisa's leisure is such that, when she arranges to meet her friends at the home of one of them, she states that they spend their time using their mobile phones, speaking to each other on WhatsApp.

Elisa: "The thing is, it's as if we were alone because the people are on WhatsApp, speaking to somebody else. And even you yourself speak to him – you just start speaking to the person in front of you, you speak to them on WhatsApp."

This synchronous communication tool is also shared by boys, as in the case of Bieito, who, owing to different family circumstances, lives with his grandparents, who act as legal tutors. They barely have any means to communicate and interact digitally at home. As a result, he uses mainly his mobile for acting in this area, in order to communicate with his parents. WhatsApp is the tool he uses, and does so quite easily, although not with the same level of command as in the other cases presented here.

These gender-based differences in the use of different tools, with video games being the main digital spaces used by boys and synchronous communication tools the most common among girls, have been shown by different research studies that point out that girls' behaviour focuses on interacting with others and they have a more communicative profile, while boys have a more participatory, solitary profile [38]. As a result, instant messaging prevails among girls. Online games are often the most usual activity among boys, as video games mostly address a masculine imaginary [38], with scarce references to female main characters with which female players can identify [39].

Another relevant issue that can be drawn from these cases is the fact that some pre-teens resort to ingenuity to interact through digital means, dodging the rules set by their parents or teachers. They describe how they manage to avoid such control by communicating through tools intended for other uses:

Elisa: "... And we have a document you write on. It's like WhatsApp, so to say. You write and people see it, but you can erase that later so they won't see it ... Google Drive."

Both Lucía and Catarina as well as Pedro show an attitude of rejection of social networks. Their stance is controlled by their parents, who set strict rules on the utilization, content and duration of use of technological means. In this sense, it is striking to find that, among the pre-teens who state that they would accept a friend request from a stranger immediately (one of the questions included for this competence), 13% are girls and 87% are boys. A clear example is Jaime, who states that this practice is part of his virtual routine.

Interviewer: "OK. And the boys you don't know, how do you – how do you speak to them? How …"

Jaime: "They send me friend requests to be my friends, and we speak, I invite them to groups ..."

Interviewer: "So what do you talk about? Well, that ..."

Jaime: "Games."

These results are consistent with those obtained in other studies, which pointed out that girls experience greater parental control of social networks, show a lower frequency of connexion to the Internet and a lower connexion rate at night. However, such parental control is less strong in the case of boys and is limited to the frequency and hours of connexion, and not the times of connexion. This finding is in line with those seen in other studies, which reported that girls experienced greater parental control than boys [40]. Previous research studies have also shown that parents display a more protective attitude towards their daughters, and that gender-based differences regarding the use of the Internet and new technologies are, to a large extent, an expression of the inequalities that exist in society [41].

In this connexion, we have examples such as Catarina and Lucía, who only rarely use ICTs to communicate or interact with other boys and girls their age, or members of their circle of friends. The communication takes place in the context of their extended family, or for homework-related issues: sending assignments to their teachers or asking other classmates about them. Lucia shows very little interest in sharing what she produces, including images, videos, photos edited using applications like Snapchat, and others. She argues that she simply does not have anybody to send them to. This behaviour perhaps results from strict parental control.

Lucía: "You can send things to people, but I have nobody to send them to and don't want to. I keep them to myself because they're for myself."

- **Digital identity**

Pre-teens' entrance into social networks involves the gradual construction of the way in which their digital identities will be shaped, as well as their ability to manage the data they generate and to protect themselves, including their digital reputation. Such construction is inevitably linked to the development of their communicative competence.

The results of the assessment test reveal that more than a half of the students (55.5%) do not know the benefits of having several digital identities, and 30% of them do not understand the consequences of having a negative identity. Also for this subcompetence, girls (X = 6) obtain, on average, higher scores than boys (X = 4.45) ($t = –2.11$; $p = 0.03$).

Pre-teens build their digital identities on the different applications they install and as they participate in social networks, which they start exploring at this age. In the cases of Elisa, Catarina and Lucía, parental control of ICT-based communication processes and social networks clearly conditions the development of their digital identities. In the case of Elisa, she is limited by the parental control rules that regulate her activity on social networks. She is not allowed to share any type of content created in her leisure time through Snapchat, and she cannot share it through any means by order of her parents. Her family does not allow her to share her image through unedited photographs or videos on social networks or send them through WhatsApp either. Her contributions in virtual contexts are scarce and neutral. Notwithstanding this, in spite of the restrictions imposed by her parents, she created a Google+ account without her parents knowing, and they were surprised when they found out. She looked up the

procedures to register on the platform and she has a profile on it, although she hardly uploads any content.

Elisa's mother: "Our surprise came from a WhatsApp conversation she had. 'I have this many followers,' 'Me, I have that many,' and you say, now look at where you have followers!"

Elisa is not aware of how her digital identity is created in the different virtual scenarios. She seems to be afraid of acting on social networks but not on other platforms that she does not consider strictly as such, like the Hangouts chatroom.

Elisa: "On Instagram, I do have only that one, the rose, and I'm not going to post any more pictures because my parents have already warned me not to post any photos of myself on Google. And there's a photo of myself on Google, one that doesn't show my face, it shows me … making a gesture like this, I think it's like this or something like this, with a friend. Because I used that one as profile picture on Hangouts… I didn't know that, and when I found out …"

In the case of the two twin sisters, they do not participate in any social networks. They do use some of them, but as content creation tools. In the interviews, we perceived a particularly critical attitude towards these spaces, which may be due to the influence of their family or even their school environment. Here, a number of initiatives have been promoted in order to inform students of the dangers of social networks.

Interviewer: "You don't want Instagram? Why?"
Lucía: "Because I think it's silly."
Interviewer: "Now, but why is that?"
Lucía: "Because you simply upload photos and … We were once given a lecture and they told us it was dangerous."
Interviewer: "They gave you that lecture at school. Who came to give it?"
Lucía: "The police."

This situation of stricter parental control in the case of girls may result, as some research studies have shown [42], from the new dangers that have emerged on the web, such as online harassment, cyberbullying or sexting. Most often, the victims of these cybercrimes belong to the female sector of the population, which may be a factor for parents to see teenage girls as more vulnerable [43]. However, as other studies have suggested, this situation, if sustained over time, may have negative effects; indeed, not taking part in these virtual spaces may have consequences for teenagers when it comes to integrating with their peers [44].

If we focus on the cases of the pre-teen boys approached in this study, Pedro describes that he has a Google account owing to his visits to YouTube, on which he uses his real name and surnames, and he has an email address on his school platform, using the Galician Government's domain. His digital identity is formed through these two tools mainly.

We should highlight how Alfonso and Antón manage their digital identities. They first register using their mother's details and then, if they see that there is not any problem, they include their own details. These may be, therefore, alternative ways to explore the spaces they find appealing, but also opportunities to "be another person" on the web.

Alfonso and Antón's mother: "Yes, last year – yeah, they'd tell me, 'Mom, can we do this and that?' And I was like, 'Whatever, you're using the computer anyway; OK, you can. But make sure you don't post any photos of yourselves.' For the moment … They're on Facebook and they're on Instagram."

Pedro and his friends build identities and shared knowledge in these online conversations, to the point that they identify themselves using profile pictures that show Spanish political figures. Such splitting of digital identities, as shown in these cases, was analyzed in a number of studies that pointed out that teenage boys tend to post false information on their online profiles more often, specifically in their self-presentation, while girls tend to try to please boys and facilitate social interaction [45],

The case of Bieito is perhaps the most striking one. After a device is passed on to him and falls into his hands, containing multiple applications with profiles that were created during previous uses of the device, he uses those profiles because they had been set up already. A false, different digital identity that gives him access to different tools that, owing to his age, he should not be able to access. As a result of a lack of advice from or control by his grandparents (due to a lack of knowledge), the only rule for him to follow is the duration of the use.

Bieito: "I also have one, but it is <oscar@gmail.com>."
Interviewer: "And – and why are you 'Óscar'?"
Bieito: "Because my cousin lent her mobile to somebody. I'm on Tuenti but I don't know the account; it was my cousin's."

It can be seen that there is no awareness of the construction of his digital identity or the potential effects of the use of profiles created with data that are not his own, and which allow him to circumvent the age limit involuntarily and unconsciously. Digital identity also allows us to tackle emergent phenomena among young people, as in this case. Here, Bieito's situation shows how the social gap and the digital gap intertwine, with the risks that this entails [44].

- **Netiquette**

The subcompetence "netiquette" refers to the social code of communication on the web, the common knowledge required for effective online communication following a number of principles on how to behave in this space [46]. In this regard, we can state that pre-teens are minimally familiar with virtual rules of conduct, and there is also a difference of more than one point between girls' average score (X = 7.15) and that obtained by boys (X = 6.07) (t = –3.95; p = 0.000).

The case studies may cast some light on this difference. As we have shown, parents exercise more control in the case of girls, setting stricter guidelines to use technologies (especially social networks) and informing of the need to be cautious and use this social space appropriately.

If we look at the answers given by these minors for each item, they reveal that 56% of the subjects are clearly aware that, when replying to a message that has more than one recipient, they must take into account if they want to reply to one or to all of them. A total of 87% of the minors bear

in mind how important it is to indicate the subject of a message before sending it. By contrast, 20% of the students believe that email addresses are not private data, and 20% of them would forward a message, even if they knew that it was false, if they received it with the indication that they would be given a gift if they forwarded it.

In our cases, we have found instances of behaviour that depart from these norms, especially in WhatsApp groups, as are the cases of Alfonso or Elisa:

Alfonso: "Or in sixth grade, I don't know. The [teacher] told us, 'I know you have a group to share your homework and all that.' And Lucía, the girl who created the group, was flabbergasted because she didn't care if people knew that we shared our homework, but the thing is, we also insulted the teacher."

We see that not very ethical attitudes towards their peers are normalized through conversations on WhatsApp or other communication channels, and the students are aware of the risks, including aggression and insults (not cyberbullying), as shown by a number of research studies on teenagers and the use of the web [47]. Elisa, for example, states that it is common for them to take screenshots of their conversations with other people and forward them to each other, disclosing people's secrets, annoyance or other private issues, as part of their leisure. The presence of these attitudes among teenagers has led to the launch of different initiatives, such as "Netiqueta Joven para Redes Sociales: ciudadanía digital y ciberconvivencia" ("Young People's Netiquette for Social Networks: digital citizenship and cybercoexistence") by PantallasAmigas [48]. These initiatives express different principles to abide by and how serious it is not to comply with them; this includes, among others, "Before posting information that was sent to you privately, ask if you can do it."

Bieito appears disorganized when it comes to acting on the web in the manner described above. His communications take place on one application only and he does not show any ability to use, for example, an email app installed on his mobile under another user's name. Also, he does not know how to write an email.

Jaime is a boy who is highly accustomed to and adept at video games and YouTube, on which he connects with other users whom he sees as friends. However, when we take a closer look at the way in which he uses the social rules described above, we notice that he does not analyze or interpret the information he finds for his schoolwork, and does not verify the sources he consults either. He normally draws information from one single web page and highlights all the contents, copying and pasting them on another document. The only case in which Jaime reviews the information is when he is translating from Spanish into Galician. For example, when Jaime tries to do his schoolwork, he does not work on it; he avoids doing what is expected from him using technical strategies, and his behaviour could be described as not very appropriate on the web. As Morduchowicz [48] pointed out, the fact that young people "copy and paste" information without applying any reflexion or creation processes confirms the idea that we cannot refer to them as digital natives. In spite of his command of the available resources, Jaime would fit in that group of teenagers with a mosaic, disorganized, decontextualized knowledge [48], who do not apply the rules or principles to use the web and do not utilize it responsibly.

Pedro declares that he has never sent an email in his life and usually chats on Hangouts, as he does not understand the value of asynchronous exchanges. However, he is aware of the rules of online conversation, particularly when they use the chatroom of their school's digital platform. In fact, he thinks that most teachers and classmates do not know that this resource exists.

Interviewer: "OK, it's Abalar. Do you have a chatroom there or not? Or is it a forum?"
Pedro: "We have chatrooms."
Interviewer: "OK, and you don't normally use it."
Pedro: "No, we don't. Because very few people know it exists and the teacher may see it."
Interviewer: "And why don't you want your teacher to see it?"
Pedro: "Not me, but some kids swear a bit, and if you say bad words the teacher –"
Interviewer: "He gets angry, doesn't he?"
Pedro: "If he catches you. But I doubt the teacher even knows that those chatrooms exist."

The twin sisters are not totally sure about the importance of keeping your passwords secret, and they point out that their school does not inform them of this type of guidelines on the appropriate use of safety measures for information that may become known and transferred to other contexts.

Interviewer: "And you tell it to other people. Yes, to whom else?"
Catarina: "To the girls, and they do it too, but it's because we're not going to log in, OK? There's nothing to see there anyway."

In this case, the use of technology is so strongly limited by the control and fear that may be inferred from their discourse that it drives the students away from virtual spaces. They almost see them as a hostile place, even when they are asked about social networks.

Catarina: "This girl … This girl wanted … She fell off a roof because … She knows another girl, and I don't know that girl, but she told me and … She wanted to take a selfie to upload it to Instagram and she fell off the roof."

There is no integrated application of any online behaviour principles, as the students' experience is scarce. It is mainly fear and their awareness of the dangers of using these spaces that drive their actions on social networks. Consequently, their actions remain very limited. In this case, it seems that any training on cybercoexistence [50], based on the principles of netiquette, is left aside, as these students do not use any virtual spaces.

VI. Conclusion

The results of this research show lights and shadows in the development of the area of communication and collaboration among Galician pre-teens. As different studies have revealed [3], [4], in spite of their close contact with ICTs and the development of technical strategies to use them, new generations are far from utilizing them in a reflexive, critical fashion.

The data obtained from both the test and the cases

contradict the idea that pre-teens are digital natives. Even though they have managed to develop their communicative competence to a sufficient degree, they are far from the high levels of competence that this hyperconnected sector of the population is assumed to have. The results show that there is a significant percentage of young people who do not reach a "pass" in this area, and that they are not able to deal with some of the subcompetences included in it, as might be expected from them. In this scenario, the digital gap emerges once again, hand in hand with the economic and social gap, which enlarges the former. The case of Bieito shows his clear disadvantage to face any virtual demands that require much more than a click.

Another element that is revealed here is the fact that communication and collaboration through digital tools vary depending on the person's gender [38]. We can see that pre-teen girls are those who best deal with communication (which encompasses a number of subcompetences such as digital identity and the form of interaction), as several previous studies had already suggested. The case study provides a deeper understanding of these differences. Girls are subjected to stricter parental control [40] and a more reflexive education on the use of ICTs, which on occasion are focused on fear or prohibition. These are barriers that some girls seek to circumvent so that they will not be left out of their group of peers. In the case of pre-teen girls, the development of their communicative competence revolves around their interactions with other people, as well as connexion and bonds of friendship. For boys, however, the core of their communication lies in video games [38] and it is through them that they communicate in real time on the chatrooms offered by these platforms.

There are big gaps in their DC: these young people have a vast knowledge of certain areas or subcompetences, but only scarce knowledge of others. Theirs is a mosaic knowledge, constituted by different parts that are not integrated into learnings that can be transferred from one context to another. The tools that do not form part of their leisure are hardly used, and they do not reflect on the importance of an appropriate use and behaviour (netiquette) beyond the technical aspects; they are satisfied with effective communication.

In this scenario, pre-teens build their digital identities, in many cases, without being aware of them [29]. They focus mainly on the danger that, they have been told, social networks represent, but they walk down a path that is much more than Instagram and TikTok and has hardly been paid any attention at home or at school.

Undoubtedly, the findings that emerge from this research emphasize the urgency of improving students' DC with a view to their "survival" in the context of digitized education in which we are immersed, and which is going to accompany us in the future. School has proven to be indispensable for their development [11], especially as a result of its role as compensator of the inequalities in the households.

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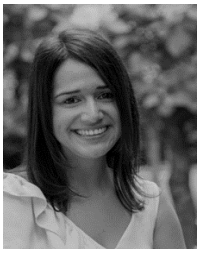

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