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Digital natives and technology for L2 learning outside of the classroom

Nativos digitales y tecnologías para el aprendizaje de L2s fuera del aula

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ABSTRACT

Extensive research has examined the classroom-based technologies that promote L2 learning among learners, who can be considered digital migrants. This mixed-method study, however, was conducted with digital natives and examined the technologies and technological features of educational resources appealing to them, in order to practice English outside of the classroom. The quantitative data were collected through a 35-question survey administered to 158 children (aged 9-11); they were enrolled in a private school in the Southeast of Mexico. The qualitative data were collected through individual interviews from a subsample of 15 learners, who exhibited positive or negative attitudes for technology in the survey. The data analyses revealed that children felt confident using a wide variety of technologies. Nonetheless, they rarely related the use of technology for L2 learning outside of the class. They opted for technological features that fostered L2 learning in line with the cognitive processes that characterize their age.

Resumen

Diversos estudios han explorado los recursos tecnológicos que favorecen el aprendizaje de lenguas segundas/extranjeras dentro del aula con estudiantes que constituyen migrantes digitales. Al emplear un enfoque mixto, este estudio exploró el empleo de la tecnología para el aprendizaje del inglés fuera del aula en un grupo de nativos digitales, así como las características de los recursos tecnológicos que prefieren. En la fase cuantitativa, se administró un cuestionario a 158 niños, con una edad entre nueve y once años, en una escuela privada del sureste mexicano. En la fase cualitativa se entrevistó a quince niños que mostraron actitudes negativas o positivas en el cuestionario. Los resultados indican que los niños se sentían cómodos empleando la tecnología para aprender inglés. No obstante, este empleo lo relacionaron exclusivamente con el aula. Las características de los recursos tecnológicos preferidos se vincularon con los procesos cognitivos que regulan el aprendizaje de lenguas a temprana edad.

Keywords
Foreign Language Instruction; Educational Technology; Elementary School; Children

Palabras clave
Enseñanza de idiomas; tecnología educativa; estudiantes de primaria

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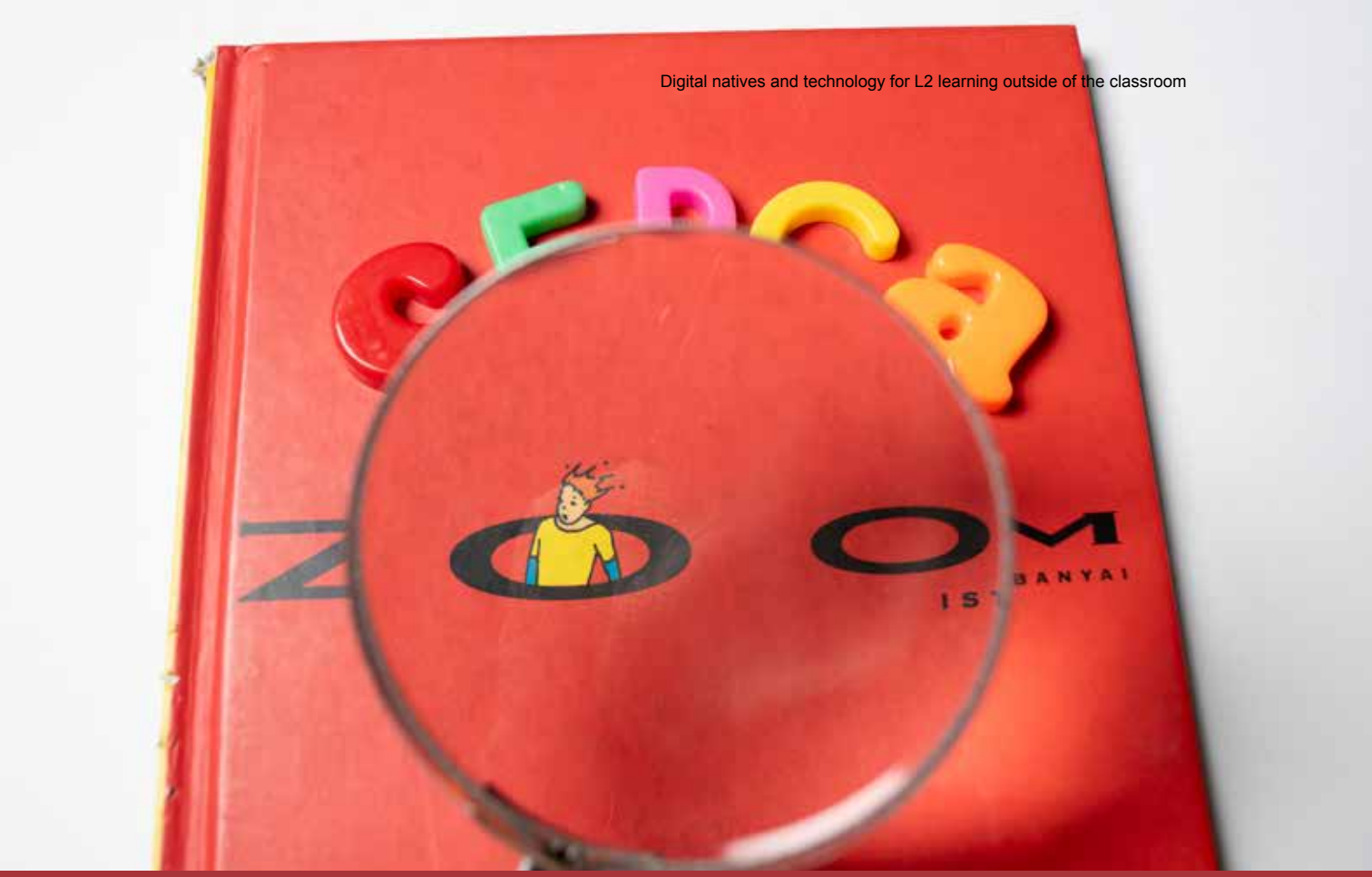

INTRODUCTION

Worldwide, educational reforms are sanctioning two curricular changes. One relates to the learning of English as a foreign/second language (L2) at a very young age (Murray & Christison, 2011; Izquierdo, García, Garza & Aquino, 2016). Reforms acknowledge English has become a global language for communication, and recognize its importance for social and business interaction. Thus, through education learners are expected to develop the necessary competence to communicate efficiently in the L2 (World Bank, 2007; Mexican Ministry of Education [Secretaría de Educación Pública, SEP], 2017).

The second change relates to the integration of information and communication technologies (ICT) in education (OECD, 2015; SEP, 2017). In this way, the reforms sustain the use of technology in education creates valuable learning opportunities and brakes barriers of age, gender and time. Therefore, teachers are expected to enhance the learning process through the use of ICT across all areas of the curriculum, including L2 learning (Coyle & Reverte, 2017; Izquierdo, De La Cruz, Aquino, Sandoval & García, 2017).

The use of technology for English Language learning constitutes an innovative aspect in these curricular changes. Nonetheless, over many years, researchers have argued that technology can be used to promote L2 acquisition, for instance through a multi-sensory experience, integrating images, graphics, videos, audio-recordings and different text types (Izquierdo, 2014; Gimeno-Sanz, 2016). To this end, numerous studies have examined how different types of technologies

could enhance L2 education among learners (Macaro, Handley & Walter 2011; Golonka, Bowles, Frank, Richardson & Freynik, 2014), who can be considered digital migrants.

These learners are adolescents or adults who hold limited knowledge of ICT, and they are newcomers to education where they are exposed to the L2 through technologically enhanced input and output tasks (Izquierdo, Simard & Garza, 2015). These studies, for instance, illustrate that with this learner clientele language learning can be facilitated through the use of blogging (Hsu, 2016), mobile devices (Bikowski & Casal, 2018), multimedia (Izquierdo, 2014), technology-mediated environments (Hung & Higgins, 2016), virtual worlds (Newgarden & Zheng, 2016), and Web 2 technologies (Liu, Wang & Tai, 2016), to mention a few ICT examples.

Conversely, the use of technology with very-young digital natives has received less attention. Digital natives are children who have had access to technology during their short lives, and have developed high levels of digital literacy. Different to their older counterparts, digital natives come to L2 education with stronger technological profiles (e.g. Yáñez & Coyle, 2011; Lee, 2012; Sundqvist & Sylvén, 2014; Liu, Wang & Tai, 2016). For them, technology does not necessarily entail an innovative aspect of the educational experience. With digital natives, a small group of researchers has examined the technologies their teachers have access to in the classrooms and how teachers maximize the use of these technologies in different types of L2 educational contexts (Hwang, Chen, Shadiev, Huang, & Chen, 2014; Sundqvist & Sylven, 2014; Izquierdo *et al.*, 2017; Navarro-Pablo, López-Gándara & García-Jiménez, 2019). Another group of researchers has started examining the technologies digital native children have recourse for fun in their free time and whether these technologies facilitate incidental L2 learning (Hannibal, 2019).

The use of technology with very-young digital natives has received less attention. Digital natives are children who have had access to technology during their short lives, and have developed high levels of digital literacy

With digital natives, however, further research is needed in order to explore the technologies that children purposefully rely on for L2 learning outside of the classroom without guidance. Moreover, there is little information on their attitudes towards the use of technology for L2 learning outside of the classroom, and the technological features that appeal to them in educational resources. With very young digital natives, it is necessary to consider that while they may feel confident using technology (Cartelli, 2013; Hannibal, 2019), when it comes to language teaching, the children: "are not simply small adults and in terms of human development they have very special needs" (Murray & Christison, 2011, p. 84). Murray and Christison (2011, p. 70) acknowledge that: "[a]s a group, young learners are very diverse. They come from different backgrounds, have different profiles." The use of various

technologies can cater for their differences and enhance their learning experience (Yáñez & Coyle, 2011).

Nonetheless, very young learners need to be able to identify resources that gradually require more logical thinking and problem solving, and help them focus on achievable language learning goals (Moon, 2000; Cameron, 2001; Murray & Christison, 2011; Hwang *et al.*, 2014). In this regard, Cameron (2001) and Moon (2000) argue educational resources implicitly rely on conventions that adults have already acquired, such as reading instructions, following logical sequences for task completion, information inferencing, etc.

Young learners, however, may lack those conventions. L2 educational resources, which require creativity, but are demanding in terms of analytical thinking (Campbell & Jane, 2012), may be overwhelming if they do not include appropriate support too (Liu, Wang & Tai, 2016). Thus, Moon (2000), Murray & Christison (2011) indicate children need educational resources that emphasize oral over written guidance, include sequencing and images which help them process the L2 without accessing highly cognitive-demanding processes.

Due to the need of research that explores the L2 ICT resources digital natives rely on outside of the class, this study addressed the following research questions: RQ1. What kind of everyday life technologies do children, classified as digital natives, intentionally use for L2 learning? RQ2. What attitudes do they display towards the use of ICT for L2 learning outside of the classroom? RQ3. What technological features do they prefer in L2 educational resources?

Very young learners need to be able to identify resources that gradually require more logical thinking and problem solving, and help them focus on achievable language learning goals

METHODOLOGY

In order to answer these questions, a mixed-method study with a sequential design (Creswell, 2018) was conducted. The quantitative phase was completed using a descriptive design, where data were collected from a group of Grade 5 learners through a questionnaire. The qualitative phase was completed through the use of a collective case study with a subsample of learners, who exhibited very positive or negative attitudes in the questionnaire. These learners participated in a semi-structured interview. In both phases, these dimensions were explored:

- *Technological access*. It is related to the availability of ICT at school and at home. Through this dimension, we explored the resources available for the participants and aspects, which could limit their exposure to ICT, such as time restriction, parents' prohibition to access ICT and bandwidth.
- *Kinds of technologies*. Considering previous classifications of children technologies (Macaro, Handley & Walter, 2011; Navarro-Pablo, *et al.*, 2019),

the following resources were considered: hardware (PC's, laptops, tablets, mobile phones and whiteboards), software (browsers, media players, multimedia, and office suits), e-files (e-books, music and films), websites and apps (online materials, smartphone apps, web games and video watching), social media (virtual communities and social networks), communication services (e-mails and instant messaging apps), and online learning environments (book supplementary resources and apps).

- *Attitudes towards the use of ICT*. Considering the work of Mahfouz & Ihmeideh (2009) and Yáñez & Coyle (2011), for instance, the attitudes were understood as the explicit expression of positive or negative feelings. Based on this definition, both positive and negative attitudes towards the use of various types of ICT for L2 learning were explored.
- *Features of technological resources for L2 learning*. This dimension explored three groups of technological features. Considering learner-related principles (Hémard, 2006), the first group of features explored learning level, learner fit and learner support. Second, the features that facilitate L2 exposure (Izquierdo, 2014) were considered: aural, visual and textual input. The third group of features related to doing and thinking activities (Campbell & Jane, 2012), which are congruent with the cognitive development of the learners.

Context & Participants

The study was conducted in a Mexican private school, where learners have access to many kinds of technologies: computers, projectors and tablets. The school has an English lab with computers, software, multimedia applications, digital books, speakers, and projection screens. This school has been incorporated into Cambridge schools and works with printed materials, which provide complementary technological resources for children to follow up on the lessons.

All the children had studied in this school since Grade 1. They held an international language proficiency certificate for young learners from the University of Cambridge. In their classrooms, they had a computer with projector, iPads, and Internet access. Attendance in the English lab

was compulsory twice a week under the supervision of their English teacher. For the study, the participants were organized into two groups.

One group with 80 children (36 boys and 44 girls) from 4th and 5th grades participated in the piloting of the quantitative and qualitative instruments. They all answered the questionnaire, and three children, between nine and eleven years old in 5th grade, completed the interview. The second group completed the final version of the instruments. The final questionnaire version was administered to 78 grade five children (42 boys and 36 girls). In order to deepen our understanding of the children's perceptions towards ICT, a subsample of 5th grade learners was interviewed. These interviewees were selected on the bases of clear divergent answer patterns in the questionnaire (Dörney, 2010; Creswell, 2018).

To this end, children's questionnaire answers were examined and a group of learners, whose answer tendencies suggested very positive (n=6) or negative (n=6) attitudes were selected. The first author, who had been the children's former English teacher and was known by their parents, administered all instruments. Prior to the study, the school authorities granted permission for the realization of the study.

Quantitative Data Collection Instrument

The questionnaire (available at www.jesusizquierdo.net/cuestionarioTIC.pdf) elicited information about the ICT children used, what they used them for and what they liked about them. The questionnaire items were based on a literature review, as suggested by Dörnyei (2010) and Fabila, Minami & Izquierdo (2012). It included items with rating scales where children expressed their opinions through degrees of agreement or frequency and items with multiple-choice answers.

The questionnaire was in Spanish and included four sections. Section 1 explored learners' ICT access. Five questions with multiple-choice answers solicited information about the devices the learners had at home and school, Internet availability and what they used technology for. Section 2 explored the technologies children use. It included ten items with a frequency scale, where they indicated how often they used ICT and the purpose for using them. Section 3 examined children's attitudes about ICT for L2 learning. It included ten items with an agreement scale, where learners expressed what they liked about using the devices for in terms of L2 learning and the L2 area they felt technologies were helpful for. Section 4 focused on the ICT features they liked the resources to have for practicing the L2. It included ten questions with multiple-choice answers. After the piloting of the questionnaire five items were modified, as they were unclear to the children.

Qualitative Data Collection Instrument

In the second phase of the study, a semi-structured interview was administered in order to complement the results of the questionnaire. The items of the questionnaire from sections 2, 3 and 4 that elicited the most frequent negative and positive answers; thus, they were used as the initial interview questions. Through these questions, the participants expanded their answers to questionnaire items 8 and 9 in section 2; 18 and 23 in section 3; and 33, 34 and 35 in section 4.

RESULTS

The following sections present the quantitative and qualitative results. In both cases, first the analysis procedures are described; then, the results are presented.

Questionnaire Results

The data in the first questionnaire section were checked to identify the number of learners, who responded to one of the possible answers to the questions. Tables 1 and 2 present the percentage

distribution of learners across the answers. Table 1 shows 86% of the participants had access to ICT not only at school, but also at home and other places. Most learners (97%) had access to Internet connectivity; and many (59%) of them used ICT for more than four hours daily. Table 2 shows students were immersed in technological access and had sustained Internet connectivity.

Table 1. Children's Access to Technology

Item and answer choices	Distribution (%)
1. Places of access	
a) Home	1
b) Home and school	13
c) Home, school and other places	86
2. Internet	
a) Yes	97
b) No	3
3.Time	
a. 0-2 hours	10
b. 2-4 hours	31
c. More than 4 hours	59

Source: own elaboration.

Section 2 of the questionnaire examined the frequency of children's use of technologies for English Language learning at home or at school, but outside of the class. Table 3 presents the percentage distribution of learners across the scale and the choices for each questionnaire item. Cronbach analyses of the frequency-scale section answers revealed a reliability alpha of .665, with corrected correlation coefficients between .3 and .2 for items 7, 9, 11 and 12, and between .2 and .1 for item 13. Other items obtained a coefficient above .3. For a better description, Table 3 in the following paragraph includes commented results, merging the percentage of students who indicated never and rarely or usually and always. This procedure facilitated reporting the use of technology as frequent (i.e. usually + always) or infrequent (i.e. never + rarely).

In Table 3, most students frequently used technologies to write in English (65.4%), to practice listening through songs and videos (67.9%), and to learn and practice vocabulary (70.5%). It also reveals that approximately a half of the children frequently use technology to practice what they learn in class (57.7%), a large percentage of students infrequently use technology to chat with friends (92.3%), for looking up new words (80.8%) or to complete schoolwork (93.6%) and presentations (98.7%).

Table 2. Children's Technologies at Home and at School

a) Computer/laptop	b) iPod	c) iPad or tablet	d) Videogames	e) Smartphones	%
25	25	25	25	25	32.1
9	9	9	9		11.5
3	3	3		3	3.8
1	1		1	1	1.3
3	3	3			3.8
11		11	11		14.1
23		23	23	23	29.5
2		2		2	2.6
1			1	1	1.3
78	41	76	70	55	

Source: own elaboration.

Table 3. Children's L2 Learning Purpose of ICT Use

ICT Use	Never	Rarely	Usually	Always
6. To read stories	24.4%	62.8%	12.8%	0%
7. To write their work in English	5.1%	29.5%	55.1%	10.3%
8. To practice listening with songs	9%	23.1%	33.3%	34.6%
9. To chat using Facebook or WhatsApp	67.9%	24.4%	5.1%	2.6%
10. To practice what I learn in my class	10.3%	32.1%	41.0%	16.7%
11. To learn new words	5.1%	24.4%	50.0%	20.5%
12. To look up unknown words	20.5%	60.3%	16.7%	2.6%
13. To complete homework using Word	78.2%	15.4%	5.1%	1.3%
14. To present with PowerPoint	80.8%	17.9%	1.3%	0%
15. To practice English using E-books with audio and video	14.1%	71.8%	11.5%	2.6%

Source: own elaboration.

Section 3 examined the attitudes of the learners towards the use of ICT for L2 learning. The distribution of children across the answer choices is presented in percentages in Table 4. In this section, Cronbach analyses revealed a reliability alpha of .558, with corrected correlation coefficients between .3 and .2 for item 21, between .2 and .1 for items 19 and 22, and below .1 for item 24 (-.048). Other items obtained a coefficient above .3. In light of these coefficients, the results from item 24 are not discussed. The results are commented, merging the percentage of students who indicated very certain and certain, or partly true and false in order to identify learners with positive or negative attitudes towards L2 learning with ICT.

In regard to item 23, the majority of the participants (88.5%) were not afraid of the ICT. The results for item 16 indicated 75.7% of the children liked using ICT to learn English. One third of the participants (33.4%, item 17) felt that it was easy to learn using computers and around half of the children considered they learn English faster using computers than books (54.3%; item 18). More than a half (59%) liked to use a computer to do their English work (item 19), and almost half of the group (43.6%) indicated they felt calm while using computers.

In regards to using help sections, half of the children reported they read instructions (item 22) only when necessary (50%). Furthermore, most children (61.5%) checked the apps' language section (item 25) only if they were not sure of their answers. In contrast, the answers for item 21 showed that approximately half of the children thought they could not learn English using ICT without adult support (53.9%).

Section 4 explored the ICT features of L2 educational resources that appeal to children. Table 5 presents the percentage distribution of the learners across the possible answers for each question. This table reveals that, for vocabulary learning (item 26), half learners (52.6%) preferred tasks that included the written form of the word with images. In reference to the kinds of ICT environments they liked for L2 practice (item 27), many learners (73.1%) preferred games, but showed little interest in structured tasks, for instance, with word lists (10.3%).

The answers to item 29 indicate children liked resources that included ICT, where they could be exposed to particular media combinations. For instance, only a very small number of children reported liking the reading tasks included written language only (14.1%). Instead, they preferred reading tasks where they could listen to the

Table 4. Children's Attitudes Towards the Use of ICT

Items	Very certain	True	Partly True	False
16. I like using ICTs to learn English	15.4%	60.3%	19.2%	5.1%
17. It's easy to learn with computer	9.0%	24.4%	44.9%	21.8%
18. I learn fast with computers	34.6%	16.7%	24.4%	24.4%
19. I use ICTs to do my work	26.9%	32.1%	20.5%	20.5%
20. I feel calm while I work	14.1%	29.5%	32.1%	24.4%
21. I can learn without help	14.1%	32.1%	29.5%	24.4%
22. I read instructions if it's necessary	25.6%	24.4%	28.2%	21.8%
23. I am not afraid of ICTs	73.1%	15.4%	6.4%	5.1%
24. I ask for help if the app fails	14.1%	32.1%	29.5%	24.4%
25. I check language if I am not sure	21.8%	39.7%	26.9%	11.5%

Source: own elaboration.

story and see images (51.3%); resources where children had written story in paragraphs with audio files were less appealing (34.6%). As for E-Books, item 30 revealed that most children (51.3%) liked them with written language and images. Fewer children (41%) liked e-books with more images than text.

A very small number of children (7.7%) liked E-Books which include text only. Answers to items 29 and 30 show children liked resources where L2 comprehension is supported with audio and images. Questions 31 through 35 examined the features and properties of applications children liked to practice the L2. The answers to items 31 and 32 indicated children liked apps that include images with bright colors (item 32; 74.4%) and music (item 31; 84.6%).

Table 5. Technological Features of L2 Educational Resources Appealing to Children

	Distribution (%)
26. To learn new words, I like apps or software include	
a) The written words only	14.1
b) Images with words	52.6
c) Videos with sounds	33.3
27. To practice new words, I like apps or software include	
a) Word lists	10.3
b) Exercises using the words	16.7
c) Games	73.1
28. When there is information or instructions, I like:	
a) Reading them	14.1
b) Listening to them	51.3
c) Ignoring them	34.6

	Distribution (%)
29. To read a story in English, I like apps include	
a) Text only	14.1
b) Audio and images	51.3
c) Text and audio	34.6
30. I prefer the electronic books to have:	
a) Text only	7.7
b) Text and images	51.3
c) More images than text	41
31. To practice English, I like applications include	
a) Music	84.6
b) Clapping and laughs	5.1
c) Other sounds	10.3
32. To practice English, I like applications include	
a) Bright colors	74.4
b) Light colors	23.1
c) Black and white pages	2.6
33. When I use apps to practice English, I like:	
a) Having the chance to correct the answers	3.8
b) Having a time limit	10.4
c) Having levels of challenge	85.9
34. To practice English, I prefer	
a) Using simple apps without challenges	0
b) Moving up through all the levels of the application	17.9
c) Choosing the section or practice level I want	82.1
35. To start using an app, I	
a) Check instructions	14.1
b) Just start	56.4
c) Start playing and if I can't, I ask or check instructions	29.5

Source: own elaboration.

The answers to item 33 further revealed that children liked apps with varying challenge levels (85.9%), but only a few liked time limits (10.4%). Moreover, the answers to item 33 indicated that having the opportunity to correct an answer is important to a few children (3.8%). Regarding item 34, most children (82.1%) liked selecting the app section they want to start at rather than following a predetermined sequence, or starting off from the first level (17.9%). Finally, item 35 revealed that instructions were not appealing to the majority of children (56.4%), or read instructions only when they were unable to accomplish the task (29.5%).

Learners clearly identified challenge as the feature that most appeals to them in L2 learning resources. Without distinction of their initial attitudes, children enjoyed the challenge that apps and ICT raise through difficulty levels rather than time limit

Interview Results

The audio-recorded interviews were transcribed verbatim. Then, following Creswell's (2018) suggestions for interview data analysis, the transcripts were first read in detail to identify relevant answers for each interview questions. The identified answers were compiled in a table to examine the answers of the two groups of participants, considering the study dimensions. Then, all the answers from both groups were contrasted. On the basis of this procedure, conclusions were made about the study dimensions (Creswell, 2018).

The first block of questions elicited children's opinions about the use of technology for L2 learning. Table 6 presents some excerpts that illustrate children's thoughts in regard to two questions. The first one related to L2 learning and the second one about the use of social media. In their answers, young learners indicated they used some ICT for deliberate language learning purposes, but were not able to see the L2 benefit of using other ICT types. For instance, they related the use of ICT to vocabulary and pronunciation learning through auditory media. Nonetheless, they did not see the opportunity to practice English through the use of social networks, which they accessed despite age requirements and security concerns. Instagram, WhatsApp and others social communication resources were used to communicate in Spanish with friends through messages or private chat rooms, because using the L2 did not seem natural.

Table 7 presents children's opinions towards learning English using technology. For the interviewers, English Language learning is associated to the use of printed books rather than to ICT. While one could expect their preference for the use of printed materials is related to the possibility of damaging the computer equipment, their reasons tightly connect with the guidance they receive from teachers as they use their textbooks, and to their preoccupation of becoming distracted during task completion by the features of the applications.

In their answers to questions in dimension 4, in Table 8, learners clearly identified challenge as the feature that most appeals to them in L2 learning resources. Without distinction of their initial attitudes, children enjoyed the challenge that apps and ICT raise through difficulty levels rather than time limit. When the difficulty level increases and they are able to succeed, they feel that are learning as their app record goes up. Moreover, difficulty levels allow them to notice their strengths and capabilities to succeed. The excitement, that challenge brings, makes instructions irrelevant since the use of the apps can be worked out through the actual task completion.

Table 6. Children's Opinions About the Use of ITC for L2 Learning

Question	Positive Attitudes Group	Negative Attitudes Group
8. Do you think you learn something listening to music in English?	S4. Yes, some words. The pronunciation	S9. New words and if I do not understand I search in the net. It appears where to click to know how to pronounce them
9. Do you use social media to communicate in English?	S6. In Instagram, there is a section where you chat with your friends but I don't think it is safe, you can contact people you don't know	S3. Yes, we have a group in WhatsApp, but they don't use it and maybe they are not interested in practicing English

Source: own elaboration.

Table 7. Children's Attitudes Towards the Use of ITC for L2 Leaning

Question	Positive Attitudes Group	Non-Positive Attitudes Group
When you have an exam do you use the books or the computer to study?	S4. There is so much information, it gives you more and sometimes it gives you things that are wrong	S12. If you use Internet.... I feel that I study another thing so it is better with the book
Do you like to use the computer to practice?	S11. I like more the books, because if I use the computer, I can get distracted with thousands of things I have there	S5. With the computer would be better, because I wouldn't have to write, only answer the exercises and it would be easier
Are you worried about breaking it down?	S6. I am not worried about that, because I know how computers work	S9. No because if something happens, I ask my father

Source: own elaboration.

Table 8. Children's Opinions About Technological Features in Educational Resources

Questions	Positive Attitudes Group	Non-Positive Attitudes Group
How do you prefer the applications to practice English with levels or time limits?	S6. I don't like the ones with time limit, because they stress me out. I like them with levels, because it gets harder each time and you use them more and more	S8. I like them with time and levels, because I think fast. S12. I like them with levels, because the difficulty increases and I learn more
Do you read instructions?	S4. I don't read the instructions. I am excited. I start playing and if I don't understand, then I read them	S7. If I see that it's easy I don't read them, but if after that I don't understand, I go back and read them to be able to play

Source: own elaboration.

DISCUSSION

This study explored the technologies that very young, digital native, learners intentionally prefer for L2 learning outside of the L2 class and the technological features of educational resources which are appealing to them. RQ1 examined what

kind of everyday life technologies children use. In line with recent ICT exploratory research with the newer generations of young L2 learners (e.g. Hannibal, 2019), our results indicate the children have access to a wide array of technologies inside and outside of the L2 class. Nonetheless, our results also indicate that access and use of technology for L2 learning do not equate. Both the qualitative and quantitative data revealed that many of the resources available to these children are not being used for L2 learning purposes.

One factor that explains this finding relates to their cognitive maturity, and in turn, a possible lack of ability to identify technologies which might be useful for language learning. Murray and Christison (2011, p. 79) argue, between seven and eleven years old, children need to learn how to learn. In terms of ICT, this implies that children need guidance to identify resources that are both learning-oriented and interesting (Hwang *et al.*, 2014; Edwards, Pemberton, Knight & Monaghan, 2002). In fact, the participating children in the qualitative instrument iterated the need for to guidance. Interestingly, however, the parents' and teachers' guidance of these children are mostly concerned with the risks and dangers that children can face while using the net.

RQ2 explored children's attitudes towards the use of different technologies for L2 learning, and RQ3 explicitly inquired about the ICT features of educational resources that appeal to children. In the qualitative and quantitative data, children demonstrated good attitudes towards using technology in different ways. This is congruent with previous research, which indicates that technology can render the L2 learning process enjoyable for very young learners (Campbell & Jane, 2012; Cartelli, 2013). The data revealed the multimodality that digital materials provide could influence children's perceptions about both the ICT and resources they like (Edwards *et al.*, 2002; Yáñez & Coyle, 2011). In this multimodality, learners exhibited a listening-with-visual support preference that is congruent with the theory of multimedia L2 learning and age maturity.

In regard to multimodal learning, with adult L2 learners, Izquierdo (2014) demonstrates that the combination of verbal and non-verbal input is particularly beneficial for L2 acquisition; in this combination, verbal language provides learners with the linguistic resources they need in their emerging L2 systems while non-verbal input, in the form of images, supports comprehension of verbal language which might be beyond the learners' current stage of language development. Our results further reveal that, in this combination, children prefer aural over written language.

Murray & Christison (2011) explain that, for children, reading in comparison to listening is a more cognitively, demanding process that slows them down and prevents them from predicting narrative content, and isolating main ideas. For children, listening, however, is more enjoyable, as it allows them to draw on their creativity (Murray & Christison, 2011, p. 79; see also Edwards *et al.*, 2002).

As for children's little interest in instructions and feedback, our results are congruent with children's cognitive maturity. Murray and Christison (2011) state that feedback is important for learners as it indicates progress, gives confidence to continue and is a step to foster autonomy. Nonetheless,

For children, reading in comparison to listening is a more cognitively, demanding process that slows them down and prevents them from predicting narrative content, and isolating main ideas

young learners have difficulty following instructions and attending to feedback, since logical thinking is still in the process of development (Murray & Christison, 2011). This raised questions about the design of effective technology-enhanced L2 resources (Hémard, 2006).

While the answer to this question could ignite a full discussion paper, on the bases of our participants' responses and literature on language learning tasks for children (Moon, 2000; Murray & Christison, 2011; Campbell & Jane, 2012), two principles can be put forward. The resources needs to present simple tasks in terms of the executable processes, yet with increasing levels of challenge. In these tasks, learners need to have extensive L2 input or output exposure, as in games (Sundqvist, & Sylvén, 2014), communication devices (Hwang *et al.*, 2014; Hung & Higgins, 2016), and resources that they also use during their spare time (Hannibal, 2019).

CONCLUSION

Our study provides original quantitative and qualitative empirical data, which suggest children have clear intuitions on the kinds of ICT they like. Furthermore, they revealed that children opt for ICT features that fostered L2 learning in line with the cognitive processes that characterize their age: creativity, curiosity, and oral input-dependence, for instance. Nonetheless, they rarely associate the use of ICT to L2 learning outside of the class.

This could relate to their level of cognitive development, as at their age, they may not be able to identify ICT which could help them achieve specific L2 learning goals. It could also be that they do not recognize the opportunity to practice and learn a L2 through ICT that they associate with their daily life. Therefore, young learners cannot be treated as adults, and thus, face their own challenges. The realization of this study also brought about challenges regarding what instruments to use, and how to control factors which could affect data collection.

One problem that needed attention related to the children's ability to provide reliable quantitative data (Butler, 2018). To overcome this issue, different strategies were put forward. First, a mixed method design became very valuable, as the qualitative results helped us compensate for the quantitative instrument's moderate reliability coefficients. In the interview, the children were able to elaborate upon their quantitative answers. Second, an interview is intimidating for a child; thus, the first author, who had been their former teacher, conducted the interviews.

Third, during the pilot, we used instructions that these children were familiar with when they answer school surveys. The findings in this study then raise questions for future research not only about the empirical and theoretical issues, which deserve attention when examining digital natives' use of ICT for L2 learning. They also set the bases for research questions regarding methodologies and instruments that lead to the collection of reliable data from very young learners. *a*

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