

Digital identity, security and digital coexistence in primary education Students

 Carlos Arribas-Sánchez^{1*},  Prudencia Gutierrez-Esteban²

^{1,2}Sciences Education Department, Faculty of Education and Psychology University of Extremadura. Spain; carribass@unex.es (C.A.S) pruden@unex.es (P.G.E.).

Abstract: The way our youth interacts with technology and social media has deeply permeated today's society, causing conflicts when integrating them into our routines and daily lives, both inside and outside our classrooms. These conflicts can make our students vulnerable, largely due to a lack of understanding of the repercussions that improper use of technologies can cause. The aim of this study is to delve into the digital identity that students exhibit online and to observe whether it is displayed securely. It also focuses on their digital coexistence, management, and purpose of use, aligning with their daily study routine. To achieve this, this study is focused on 151 students' habits from 4th, 5th, and 6th grades of Primary Education through a questionnaire consisting of 26 items distributed across 4 dimensions (age of device acquisition, exposure time and study habits, management and purpose of use, and digital identity, security, and digital coexistence). The results confirm an increasingly premature immersion in digital devices, the internet, and social networks, and a clear need to address and work on the digital identity of our students securely and stably, providing them with proper digital education.

Keywords: Digital technologies, Digital identity, Digital coexistence, Primary education, Save Internet use.

1. Introduction

The integration of technology and social media into the lives of our children and adolescents has profoundly impacted contemporary society, leading to challenges in incorporating them into our daily routines, both within and beyond the educational setting. These challenges expose our students to vulnerability, primarily stemming from a limited understanding of the potential consequences associated with the improper use of technologies.

The aim of this work is to explore into the digital identity that students exhibit online, as well as to observe whether it is presented in a secure manner. It also focuses on their digital coexistence, management, and purpose of use particularly in relation to their daily study routines.

In order to carry out the interest of this research, we focus on what age are digital screens introduced to students and what influence do they have on their study habits.

Primary stages represent a critical period since it is the period in which our identity begins to form. As Muñoz Muñoz and Cardoso Pulido (2021) argue, identity is not a state but it is a process that we build throughout life in the various social contexts where we move. This identity is greatly accentuated at the speed at which our society advances and the dizzying changes that the digital era has brought, where the language and reality of students are being created based on international electronic codes (Gómez-Calcerrada & Montoro, 2022).

Underage children have an easy access to devices, which are most of the time provided by their own parents (Martín, Muñoz-Repiso, & Gómez-Pablos, 2017). According to Terán (2019) prolonged exposure of children to technology and screens can lead to numerous early developmental problems, specially at early ages and during adolescence. For example, the maturation of the central nervous

system is responsible for making correct decisions and controlling and managing impulsiveness, so prolonged exposure to screens can significantly determine the brain's maturation, turning the age range into an important risk factor.

Unsupervised use and overexposure of students to screens favour the appearance of educational risk factors such as a decrease in levels of self-regulation, attention, and self-control, as well as an increase in impulsivity that can lead to future learning difficulties associated with attention deficits and lower academic performance (Echeburúa & De Corral, 2010).

According to the frequency and purpose of use, children who have access to their own device such as tablets and smartphones tend to use them more frequently and intensively daily than minors who do not have private devices or must share them with other family members. One aspect and characteristic of video games is the online participation and with it the involvement of hierarchies and social relationships within the team game. Similarly, online video games increase the number and social contact through "virtual" friends (Echeburúa & De Corral, 2010).

The ease that they find behind a screen to socialize and interact with others Bayer, McMillan, Murphy, and Timmins (2016); Punyanunt-Carter, De La Cruz, and Wrench (2017); Segovia, Corral-Pérez, and Almajano (2016) and Yau and Reich (2019) with real-time online communication being the main goal of Internet connections, with the fundamental objective of maintaining contact with the network of friends (Torra-Bou et al., 2016).

The increasing popularity of the Internet and the excessive use of new technologies have become a constant need in people's daily lives, especially for adolescents and children (Terán, 2019). Digitalization not only affects users' access and exchange of information but also intersubjective relationships and interpersonal communication, as well as new ways of identity and being (Martín et al., 2017).

Some of the most attractive characteristics of screens that can lead to high consumption of digital devices by our students are the ease and speed of access, the enormous possibility of accessing all kinds of content and stimuli, the feeling of control and dominance in games, immediate rewards, affirmation of identity in the community, or anonymity, among others (Terán, 2019).

The social construction of identity focuses on identifying the resources or benefits that are made available to people through their social interactions (García-Soidán, Boente Antela, & Leirós-Rodríguez, 2020b). In this sense, young people who are disconnected from cyberspace are excluded from a sphere of social interaction that is part of the daily life of an entire generation (Antón & Levratto, 2021). This aspect provides us with many clues about the factors that facilitate or hinder digital social inclusion and exclusion.

The works carried out by Area Moreira, Borrás Machado, and San Nicolás Santos (2015) and Tsitsika et al. (2014) highlight the importance of social networks in their daily lives, welcoming them as tools that offer them multiple options and opportunities to communicate, learn and enjoy entertainment.

According to the responsible use of social media and the management of their digital identity and possible risks involved, *the resolution of May 4, 2022, from the General Direction for Evaluation and Territorial Cooperation*, which publishes the Agreement of the Sectorial Conference on Education, on the update of the European Framework for the Digital Competence of Educators, published in the BOE on May 16th, 2022, in its Annex I, Area 1. Professional Engagement and section 5, refers to the protection of personal data, privacy, security and digital well-being.

In its description emphasizes the need to protect personal data, communications, and device access in the educational field to safeguard the digital rights of all members of the educational community as per current legislation. It highlights the importance of using digital technologies responsibly, safely, and healthily to prevent risks that may impact occupational, personal, and environmental aspects, ensuring the overall well-being of students.

In its area 6, Facilitating Learners' Digital Competence, in its section 2, it refers to communication, collaboration and digital citizenship. In its description, it is noted that proposals for the development

and evaluation of students' digital competence in communication and collaboration using technologies while respecting digital etiquette, as well as for the construction of responsible digital citizenship and identity, must be designed, implemented and integrated into teaching and learning processes.

In the same area, in section 4, it refers to responsible use and digital well-being, and its description includes the design, implementation and integration of proposals for the development and evaluation of students' digital competence in the safe, responsible, critical, healthy and sustainable use of digital technologies in teaching and learning processes.

Underage children represent the most vulnerable group in terms of privacy and content appropriateness. On the one hand, they are unaware of the privacy settings of their profiles, with the majority being public (Arbós, 2021; Del Prete & Redon Pantoja, 2020). On the other hand, they do not distinguish appropriate and truthful pages from inappropriate or violent ones.

Some of the risks that underage children may face when having unlimited and uncontrolled access to the Internet are cyberbullying, violation of privacy, access to inappropriate content such as pornographic content, violent messages, offensive messages, incitement to anorexia, suicide, and so on (Montiel & Agustina, 2023).

Given the importance of Information and Communication Technologies (ICT) in the development and scenario of children and young people, it would be a serious mistake for adults not to try to prevent their access. The problem is not solved by prohibition, but it is solved by giving information and working to promote correct and responsible use (Gee & Esteban-Guitart, 2019). Therefore, deepening the construction of adolescents' digital identity in their own environment is necessary to effectively address emerging youth phenomena such as social gaps, risks, social mobilization from the educational field.

2. Methodology

This research uses a quantitative design and to this end, it has the following objectives to:

- Analyse students' screen exposure and behaviours considered risky according to the literature.
- Study the initiation of minors in the use of digital devices, the internet, and social networks.
- Examine the usage habits and purposes that students have when using digital devices, the internet, social networks, and video game consoles.
- Verify the exposure to digital devices, the internet, and social networks and their influence on students' study habits.
- Identify the educational gaps students have regarding internet safety and digital identity management.
- Deepen knowledge of students' digital profiles on the internet and social networks and assess their level of security awareness.
- Understand the importance students place on security in managing social networks.
- Investigate how students conceive their digital identity and understand how they manage it.

These objectives are linked to the following hypotheses:

H1.- The younger the age at which digital screens are introduced, the greater the absence of study habits.

H1.1.- For male students, the younger the age at which digital screens are introduced, the greater the absence of study habits.

H1.2.- For female students, the younger the age at which digital screens are introduced, the greater the absence of study habits.

The prolonged and constant use of digital screens by students is inevitably related to learning difficulties, resulting in an increase in the incidence of psychological disorders such as oppositional defiant disorder or attention-deficit/hyperactivity disorder, highlighted previously and in line with several studies (García-Soidán, Boente Antela, & Leirós-Rodríguez, 2020a).

The lack of time control in screen use is observed, an important risk factor that can predispose to some learning difficulties such as lack of attention, impulsivity, self-regulation, lower self-control, and lower academic performance (Vannucci, Simpson, Gagnon, & Ohannessian, 2020).

H2.- The screen exposure time increases as age increases.

H2.1.- For male students, the screen exposure time increases as age increases.

H2.2.- For female students, the screen exposure time increases as age increases.

Talking about the term cyberculture is crucial to understand how new technologies are affecting society and individuals. The new technological context is changing everyday life, as well as the way we perceive space and time, communicate, entertain, relate, and access knowledge.

It has become normalized to have a personal smartphone at an early age, which in many cases has been facilitated by parents who are also overexposed to technology. This is due to the current culture of developed countries, as argued by Bonilla-del-Rio and Aguaded (2018) which is a culture of immediacy. A study by the Net Children Go Mobile Project between 2010 and 2015 states that children of Internet and smartphone-using parents tend to have a wider range of devices for their own use (García-Soidán et al., 2020a).

H.3.- The older the age, the greater the need for the use of digital devices.

H.3.1.- For male students, the older the age, the greater the need for the use of digital devices.

H.3.2.- For female students, the older the age, the greater the need for the use of digital devices.

Immersion into the internet is becoming increasingly premature, even below the allowed age limit, as noted by Terán (2019). According to Arbós (2021) the daily consumption and the way of perceiving the environment through screens are generating a digital identity in our students, with platforms that encourage the normalization of behaviors such as publishing content and imitating public figures they follow.

Children and adolescents, unlike adults, use video platforms as stages to perform, tell stories, and express their opinions and identity characteristics (McRoberts, Bonsignore, Peyton, & Yarosh, 2016).

H.4.- The higher the exposure to social media, the greater the management of digital identity and the greater the emphasis that must be placed on the importance of its correct use.

H.4.1.- For male students, the higher the exposure to social media, the greater the management of digital identity and the greater the emphasis that must be placed on the importance of its correct use.

H.4.2.- For female students, the higher the exposure to social media, the greater the management of digital identity and the greater the emphasis that must be placed on the importance of its correct use.

If we consider that identity is built from the context that surrounds us, and if the Internet is part of most of our students' time, it can be observed an impact on the construction of who we are and how we operate in the world. That is why there is a clear need to address and work on students' digital identity from educational institutions.

This identity is greatly featured by the speed at which our society is advancing and the dizzying changes that the digital era has brought, where the language and reality of students are being created from international electronic codes (Montiel & Agustina, 2023).

According to Del Prete and Redon Pantoja (2020) the use and access of social networks has become a new environment for socialization for young people, a space for building social identity with peers, sometimes with no parental control or advice, and even though it is known that immersion in them is becoming increasingly premature and below the minimum age allowed.

Some of the risks that minors may face when having unlimited and uncontrolled access to the Internet are cyberbullying, violation of privacy, access to inappropriate and violent content, offensive messages, etc (Vannucci et al., 2020).

2.1. Instruments

The instrument used for data collection has been a questionnaire which was completed inside the classroom. This consisted of 26 items divided into four dimensions (see Table 1): Age of device

acquisition (D1), Exposure time and usage habits (D2), Management and purpose of use (D3) and Digital identity, security and coexistence (D4).

Table 1.

Questionnaire dimensions.

Name	Dimensions	Items
Muñoz Muñoz and Cardoso Pulido (2021)	Dimension 2: Exposure time and study habits Dimension 4: Digital identity, security and coexistence	5, 6, 7, 8 17, 19
López Berlanga, Ortiz Jiménez, and Sánchez Romero (2022)	Dimension 1: Age of device acquisition Dimension 3: Management and purpose of use Dimension 4: Digital identity, security and coexistence	1, 2, 3, 4 10, 11, 12, 13 14, 18, 20, 21, 22, 23, 24, 25, 26
Antón and Levratto (2021)	Dimension 3: Management and purpose of use Dimension 4: Digital identity, security and coexistence	9 15,16

Source: Authors and questionnaire dimensions.

2.2. Participants

This study had 151 participants, organised into 6 groups of students aged 9 to 12 years old. 70 were female gender, 80 male gender and 1 chose “I prefer not to say” in a primary school based in Badajoz, Spain. Our informants belong to 3 different grade levels: 4th, 5th and 6th primary grade.

Table 2.

Study participants.

Gender	4 th Grade	5 th Grade	6 th Grade	Total
Female	20	22	28	70
Male	30	29	21	80
I prefer not to say	0	0	1	1
Total	50	51	50	151

Source: Gender distribution.

3. Analysis And Results

The descriptive analysis shows that 64.2% of the respondents acquired a digital device with internet connectivity for the first time before the age of 9, of which 57.7% are male gender. Similarly, 50.3% connect to a social network before the age of 9, of which 57.3% are male gender. The 53.6% of students dedicate 2 or more hours to studying daily, and the vast majority of them (82.8%) use the computer and the internet for their homework, with no gender difference. Social networks help them in their learning is believed by the 62.3%, of which 92% are male.

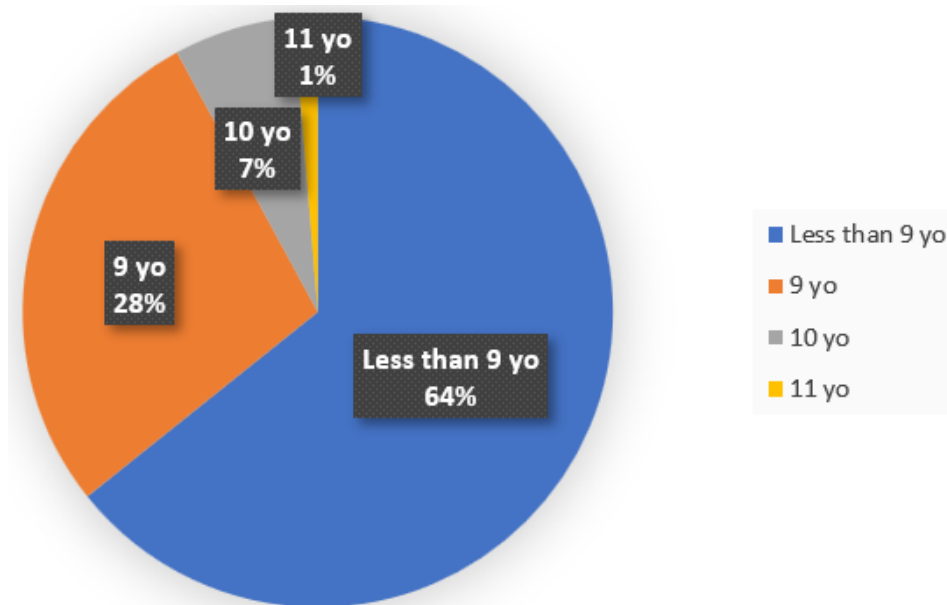


Figure 1.
At what age did you get your first internet-enabled device?

Just a few of the students (11.9%) spend 30 minutes or less watching TV or interactive digital platforms daily, of which the majority are male gender (55.5%). 44.4% spend one hour, and the rest of them spend 2 or more hours per day.

Almost half of the students (47.7%) usually use their digital devices at night, of which the vast majority (59.7%) are male gender. They respond immediately when receiving a message on social networks (62.3%), of which 55.3% are male gender. Some of students (36.4%) feel somewhat or quite nervous when they cannot connect to the internet or a social network, and most of them are male gender (60%).

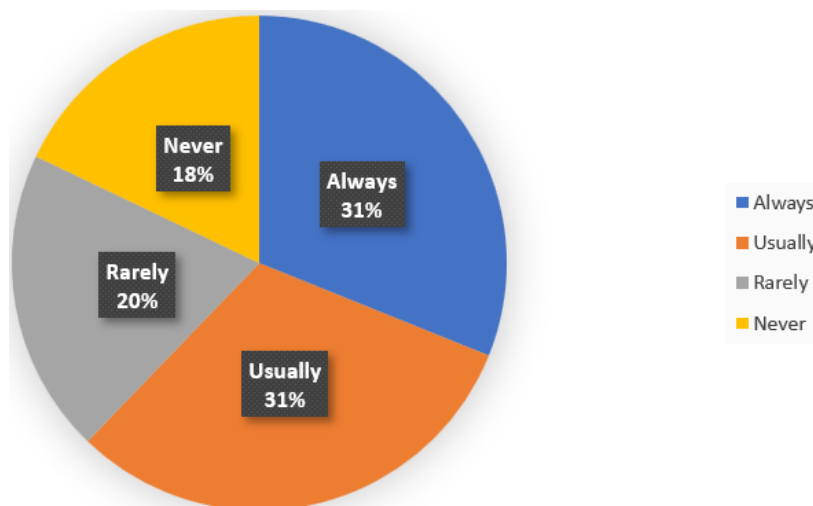


Figure 2.
I respond immediately when receiving a message on social networks.

Half of the students (51.7%) share their passwords with their parents, with no gender differentiation. Some of them (34.4%) refer to their personal life on social networks and many of them are female gender (51.9%).

Public profiles on social networks are had by the 19.6% of students, and the vast majority are male gender (67.8%). The 38.5% of them are unsure and they don't know if their profiles are public or private, with no gender difference. Almost the majority of them (68.5%) usually think about the consequences before posting information on social networks, without gender appreciation.

The 10.6% have searched for friends on the internet in the last 6 months, where most than the half (56.2%) are male gender. A fewer percentage (5.3) have pretended to be someone else on social networks, with no gender difference. Only the 2% of them have shared information or photos with someone the student has never met in person, mostly males. Finally, the 1.3% have spread rumours online, all of whom are females.

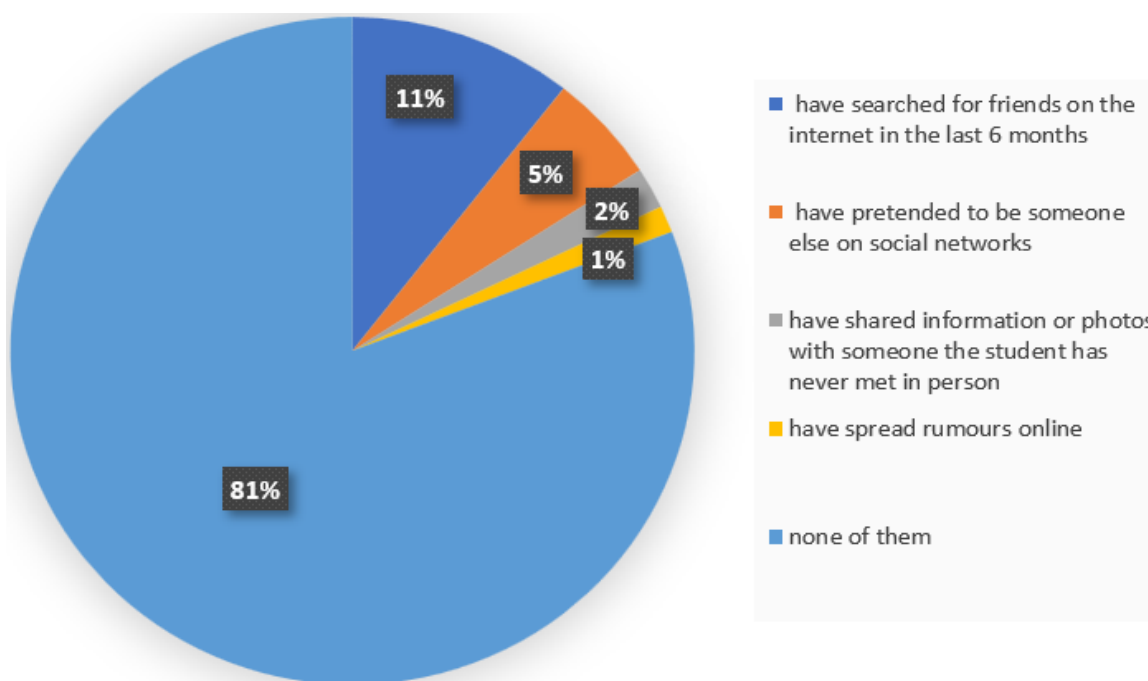


Figure 3.
From the list, which one have you done in the last 6 months?

A fewer percentage (9.3) have felt threatened on social networks, with no gender difference. An important number of them (60.9%) think that social networks are an easy medium to harm people, of which only the 46.7% are female gender. Only 38% of students consider themselves capable of detecting cases of online harassment, without gender difference.

Almost the total of students (80%) state that teachers explain strategies for prevention, safe use, and risks on the internet, with no gender bias. Families explain strategies for prevention, safe use, and risks on the internet is said by the 85% of students, where a little more than the half (54.6%) is male gender. Families control their access time to the internet is indicated by the 87.2% of the students with no gender bias.

In terms of inferential analysis of the collected data, to test the hypotheses, the normality assumption (Kolmogorov-Smirnov/ Shapiro-Wilk's test), the randomization assumption (Run's test) and the homoscedasticity assumption (Levene's test) were performed to determine whether the hypotheses could be tested by applying parametric or non-parametric tests. According to the results

obtained, all the hypotheses were tested via non-parametric statistical models. Table 3 shows the hypotheses, the statistical models used to test each of the hypotheses, as well as their significance and their results.

Table 3.
Hypotheses: Testing results.

Hypotheses	Statistical model	<i>p</i>	Results
H.1.: The younger the age at which digital screens are introduced, the greater the absence of study habits.	Ostertagova, Ostertag, and Kováč (2014)	0.097	The null hypothesis is accepted.
H.1.1.: In male students, the younger the age at which digital screens are introduced, the greater the absence of study habits.	Ostertagova et al. (2014)	0.657	The null hypothesis is accepted.
H.1.2.: In female students, the younger the age at which digital screens are introduced, the greater the absence of study habits.	Ostertagova et al. (2014)	0.019	The null hypothesis is rejected. The working hypothesis is accepted.
H2.: The screen exposure time increases as age increases.	Ostertagova et al. (2014)	0.230	The null hypothesis is accepted.
H2.1.: In male students, the screen exposure time increases as age increases.	Ostertagova et al. (2014)	0.715	The null hypothesis is accepted.
H2.2.: In female students, the screen exposure time increases as age increases.	Ostertagova et al. (2014)	0.204	The null hypothesis is accepted.
H.3.: The older the age, the greater the need for the use of digital devices.	Ostertagova et al. (2014)	0.235	The null hypothesis is accepted.
H.3.1.: In male students, the older the age, the greater the need for the use of digital devices.	Ostertagova et al. (2014)	0.757	The null hypothesis is accepted.
H.3.2.: In female students, the older the age, the greater the need for the use of digital devices.	Ostertagova et al. (2014)	0.257	The null hypothesis is accepted.
H.4.: The higher the exposure to social media, the greater the management of digital identity and the greater the emphasis that must be placed on the importance of its correct use.	Ostertagova et al. (2014)	0.212	The null hypothesis is accepted.
H.4.1.: In male students, the higher the exposure to social media, the greater the management of digital identity and the greater the emphasis that must be placed on the importance of its correct use	Ostertagova et al. (2014)	0.086	The null hypothesis is accepted.
H.4.2.: In female students, the higher the exposure to social media, the greater the management of digital identity and the greater the emphasis that must be placed on the importance of its correct use.	Ostertagova et al. (2014)	0.659	The null hypothesis is accepted.

The results show that there are no significant statistically differences in all the hypotheses, accepting the null hypothesis and rejecting the working hypothesis, except in hypothesis H1.2.: For female students, the younger the age at which digital screens are introduced, the greater the absence of study habits where $p = .019$, the working hypothesis is accepted, and the null hypothesis is rejected.

4. Discussion

The data analysis highlights a significant number of students for whom the internet has become a tool for daily entertainment and social distraction (Muñoz Muñoz & Cardoso Pulido, 2021). However, there is evidence of integration into their daily lives with a pedagogical use for completing their homework. According to our research, internet immersion is becoming increasingly premature, consistent with the findings of Terán (2019).

Furthermore, controlled screen time is observed by parents, a factor that somewhat mitigates a significant risk of addiction and predisposes certain learning difficulties such as lack of attention, impulsivity, self-regulation issues, decreased self-control, and lower academic performance (Vannucci et

al., 2020). However, an urgent need to respond immediately to messages has been identified. There is a high reliance on the use of digital devices at night before bedtime.

Our research reveals a rapid and impactful consumption of digital media among children aged 9 to 12, coupled with easy access to devices, most often provided by parents (Del Prete & Redon Pantoja, 2020). Undoubtedly, the daily consumption and perception of the environment through screens are contributing to the formation of a digital identity in our students, with platforms encouraging the normalization of behaviors such as content sharing and imitation of public figures (Gómez-Calcerrada & Montoro, 2022; González Ramírez & López Gracia, 2018). However, our respondents demonstrate empathy and careful consideration of consequences before posting or commenting on social media.

Adding to this, the primary stages represent a critical period during which our identity begins to take shape, thus exerting a significant impact on our construction of self (Antón & Levratto, 2021). It's essential to note that privacy is a risk factor for young individuals on these platforms, a concern that many are unaware of (McFarquhar et al., 2020). Nevertheless, both families and educators express their concerns and explain the challenges. While a good number of students are aware of the risks of the internet, they struggle to identify if any of their friends are experiencing online harassment.

5. Conclusions

Given the evidence studied and the data obtained during the research, the following points can be emphasized:

Overall, the analysis focuses on students' screen exposure, revealing that immersion in digital devices, the internet, and social networks is increasingly premature, as also noted by (Terán, 2019). It is evident that their use is deeply integrated into their routine and daily lives, serving not only for leisure but also for work and study. Analyzing its influence on the study habits of the surveyed students supports the hypotheses posed in the study, specifically for female students, the younger the age at which digital screens are introduced, the greater the absence of study habits.

Greater emphasis needs to be placed on the digital identity of the students studied, as deficiencies in their security and the information they share on social networks are apparent by Gómez-Calcerrada and Montoro (2022). Undoubtedly, the advancements in emerging technologies and the internet are essential tools in our daily lives, bringing numerous advances and changes in the way we learn and process information. However, excessive and uncontrolled consumption by our youth can pose a significant risk to their maturation and emotional development, impacting concentration, learning ability, frustration, identity, and their perception of the world.

The type of information consumption (quick, immediate, and impactful) provided by the internet makes it a challenge for our students to engage in the same way in the classroom, leading to learning difficulties, primarily stemming from cognitive origins and lack of attention. Educational stakeholders such as schools, teachers, institutions, associations and so on must confront this paradigm noted by Muñoz Muñoz and Cardoso Pulido (2021).

This study highlights a clear need to address and work on the digital identity of our students in a secure and stable manner. This is crucial to provide them with proper digital education, but not only within educational institutions, also at home through families. This is not only to safeguard their identity or promote diversity but also to teach them to construct knowledge that does not exist yet, like it is shown by Gómez-Urrutia and Jiménez Figueroa (2022).

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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