Children, youth and media
in the era of smart devices:
Risks, threats and opportunities

Niños, adolescentes y medios en
la era de los dispositivos inteligentes:
Riesgos, amenazas y oportunidades

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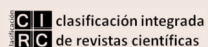
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Children, youth and media in the era of smart devices: Risks, threats and opportunities

Niños, adolescentes y medios en la era de las pantallas inteligentes: Riesgos, amenazas y oportunidades

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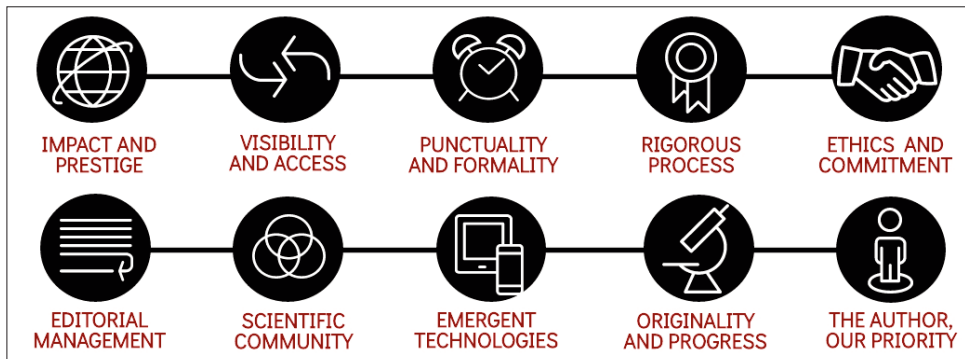
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Sexting in adolescents: Prevalence and behaviours

Sexting en adolescentes: Prevalencia y comportamientos

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ABSTRACT

Sexting is among the practices used by young people to explore their sexuality. Although an educational response to all facets of this phenomenon is recommended, little research has been published to date in Spain that analyses its prevalence by differentiating between the different types of sexting behaviours: sending, receiving, third-party forwarding, and receiving via an intermediary. This gap in the research is addressed by exploring: 1) Sexting prevalence, differentiating between behaviours; 2) Relationships between sexting behaviours and gender, age, sexual orientation, having a romantic/sexual partner, social networking sites used, and the degree of normalisation and willingness to sext; 3) Gender-based differences. In total, 3,314 adolescents aged 12 to 16 years participated in the study. The most frequent sexting behaviours were identified as receiving and receiving via an intermediary, followed by third-party forwarding and the sending of sexual content. The relative importance of each analysed variable depended on the specific sexting behaviour and the participants' gender. The results highlight the need to analyse the diversity behind sexting behaviours and to address each one in an educational setting. This more detailed look at the different behaviours can be used as the basis for raising awareness and decision-making in education.

RESUMEN

El sexting es una de las prácticas a través de la que los jóvenes exploran su sexualidad. Aunque se recomienda responder educativamente a todas las formas en las que se puede expresar este fenómeno, en España, se ha publicado poca investigación que analice su prevalencia diferenciando los distintos tipos de comportamientos de sexting: envío, recepción, reenvío y recepción de reenvíos. El presente estudio aborda esta brecha en la investigación explorando: 1) La prevalencia de sexting, diferenciando entre comportamientos; 2) Las relaciones entre los comportamientos de sexting y el género, la edad, la orientación sexual, tener pareja romántica/sexual, las redes sociales utilizadas, el grado de normalización de sexting y la predisposición para participar en él; 3) Las diferencias de género. En total, participaron 3.314 adolescentes de 12 a 16 años. Los comportamientos de sexting más frecuentes fueron la recepción y la recepción de reenvíos, seguidos del reenvío y el envío. La importancia relativa de cada una de las variables analizadas dependió del comportamiento analizado y del género de los adolescentes. Los resultados destacan la importancia de analizar la diversidad de los comportamientos de sexting y abordar cada uno de ellos desde la educación. Este punto de vista más detallado sobre los diferentes comportamientos podría utilizarse como base para la toma de decisiones educativas y de sensibilización.

KEYWORDS | PALABRAS CLAVE

Sexting, adolescence, prevalence, normalisation, willingness, social networking sites, gender, education.
Sexting, adolescencia, prevalencia, normalización, predisposición, redes sociales, género, educación.

1. Introduction

Sexting (the sharing of self-produced sexual material through electronic means) is one of many behaviours adolescents adopt to express and explore their sexuality. Sexting often leads to positive outcomes, but it can also have negative repercussions (Englander, 2019) that pose new challenges for parents and educational professionals (McEachern et al., 2012). Risks may increase given the peer pressure to engage in sexting, the non-consensual dissemination of sexting messages, and the presence of associated risks such as (cyber)bullying (Medrano et al., 2018). Thus, an educational response to the myriad of ways this phenomenon can be expressed is recommended. Forwarding is a behaviour that must clearly be avoided, and strategies for tackling it need to be taught (Van-Ouytsel et al., 2014). However, we also need to know how best to act when this kind of content is received (Mitchell et al., 2012) and how to engage in sending sexual content safely (Wurtele & Miller-Perrin, 2014).

Within the current context, few studies have been published in Spain which analyse sexting prevalence by differentiating between the different types of sexting behaviours. Most studies focus on a single behaviour, such as sending (Gámez-Guadix et al., 2017) or receiving (Garmendia et al., 2016). However, other sexting behaviours may entail different consequences for those involved and need to be addressed in education. As such, it is important to disentangle the diversity behind sexting behaviours, going beyond sending and receiving by also including the forwarding of personally received sexts and the further transmission of a third-party sexting message.

1.1. What does sexting imply?

A first broad differentiation of sexting behaviours can be made between active sexting (sending or forwarding) and passive sexting (receiving directly from the creator or receiving content forwarded by third-parties) (Barrense-Dias et al., 2017). A further distinction can be made between primary sexting (sending and receiving), where sexual content is normally exchanged consensually amongst peers and not sent to anyone else (except for group pressure, sextortion...), and secondary sexting (forwarding and receiving via an intermediary), when someone shares the sexual content beyond the intended recipient, often non-consensual (Schmitz & Siry, 2011).

In this context, we find restrictive definitions that limit sexting to sending sexually explicit images (Marume et al., 2018) as well as more comprehensive definitions that describe it as the sending, receiving and forwarding of sexually suggestive and explicit images, videos or text messages (Mitchell et al., 2012; Villacampa, 2017). However, studies that adopt a comprehensive definition sometimes fail to differentiate between separate behaviours which are included (Beckmeyer et al., 2019; West et al., 2014).

Consequently, in the present study, sexting is defined as sending, receiving and forwarding sexually suggestive and explicit images, videos or text messages via the internet and electronic media, and each sexting behaviour is analysed independently.

1.2. How prevalent is sexting?

Sexting prevalence rates among adolescents vary according to the criteria used to define the phenomenon, the age of the participants, the time range and measuring instrument, among others (Barrense-Dias et al., 2017). In a recent meta-analysis, which examines studies from the USA, Europe, Australia, Canada, South Africa and South Korea, the average prevalence of sending sexual content was 14.8%; receiving sexts was 27.4%; forwarding a sext without consent was 12.0%; and receiving a forwarded sext was 8.4% (Madigan et al., 2018). However, no studies from Spain featured among this literature.

Specifically, in Spain, few articles have analysed sexting prevalence, differentiating between specific types of sexting behaviours. Villacampa (2017) found that 7.9% of 489 youths aged between 14 and 18 had produced content of this type, whereas Gámez-Guadix et al. (2017) found that the prevalence for sending sexts in 3,223 youths aged 12 to 17 years was 13.5%. Moreover, Garmendia et al. (2016) observed a considerable increase in the receiving of sexual content, whereas Villacampa (2017) reported that the rate of third-party forwarding of sexual images or videos was 8.2%.

1.3. Sexting engagement and its associated characteristics

International studies have reported considerable variability in sexting prevalence based on sociodemographic characteristics (Olivari & Confalonieri, 2017). The previously mentioned meta-analysis found that sexting participation rates increase with age (Madigan et al., 2018). It also occurs more frequently between desired or actual sexual and/or romantic partners (Beckmeyer et al., 2019; Wood et al., 2015). Despite the limited number of studies analysing prevalence in adolescents based on sexual orientation, there do seem to be significant differences. Non-heterosexual adolescents appear more involved in sending and receiving sexual content than their heterosexual peers, though not in non-consensual forms of sexting (Van-Ouytsel et al., 2019).

Regarding gender, a range of results have been reported. Some studies found that girls are more likely to send sexual images than boys (Ybarra & Mitchell, 2014) whereas, in contrast, boys participate to a greater extent in sending, receiving and third-party forwarding (Strassberg et al., 2017). Other studies, however, found no gender differences in the rates of sending and receiving sexual messages or images (Beckmeyer et al., 2019; Campbell & Park, 2014).

Specifically, in Spain, few studies were identified as analysing different sexting behaviours based on these sociodemographic variables. Garmendia et al. (2016) found that receiving sexts increases with age. Likewise, in a study developed by Gámez-Guadix et al. (2017), boys sent more sexual text messages than girls, but no significant differences were found in sending images/videos. In addition, sending this type of content was significantly more likely among non-heterosexual adolescents (Gámez-Guadix et al., 2017).

Despite the differences in sexting prevalence, studies show considerable percentages of involvement and some even claim that it is a common behaviour in online interactions during adolescence (Gámez-Guadix et al., 2017). However, although it is true that the exchange and visualisation of sexual content is becoming increasingly more normalised among adolescents and young people, that is, they perceive sexting as a mainstream, standard behaviour (Stanley et al., 2018), it cannot be considered a normative practice, which most of them do (Van-Ouytsel et al., 2015).

Adolescents generally believe that the messages shared in their environment (i.e. those coming from friends and the media) influence their predisposition to sext by implying it is normal (Davidson, 2015). Yet the majority, regardless of their gender or age, do not participate in sexting, meaning that it does not fall under a normative aspect of adolescent flirting and relationships (Wood et al., 2015).

1.4. Current study

Despite the real concern about preventing the negative consequences of sexting, little research has been published to date in Spain that analyses sexting prevalence by differentiating between the different types of behaviours. Furthermore, sexting is a phenomenon closely linked to social norms, so it is important to address both sexting normalisation and gender differences (Symons et al., 2018; Wood et al., 2015).

This would allow us to gain a better understanding of its complexity and effectively analyse this phenomenon, thus laying the groundwork for educational efforts. As such, this exploratory study seeks to: 1) Analyse sexting prevalence, differentiating between the four behaviours: sending, receiving, third-party forwarding, and receiving via an intermediary; 2) Identify whether gender, age, sexual orientation, having a romantic/sexual partner, SNS used, degree of normalisation and willingness to sext predict each sexting behaviour; 3) Explore gender differences.

2. Method

2.1. Participants

The sample comprised 3,314 adolescents (48.6% girls) aged between 12 and 16 years (M_{age}=13.63, SD_{age}=1.23) recruited from 15 secondary schools in the south of Spain. Specifically, they came from the provinces of Seville, Huelva and Córdoba in the Region of Andalusia (Table 1).

Table 1. Sample characteristics		
Variables	**N**	**%**
Sexual orientation		
Heterosexual	1602	85.6
Non-heterosexual	270	14.4
Asexual	133	7.1
Bisexual	112	6.0
Homosexual	25	1.3
Romantic/sexual partner in the last 3 months		
Yes	1015	31.4
No	2218	68.6
SNS used		
None	53	1.6
At least one	3259	98.4
WhatsApp	3197	96.6
Instagram	2737	82.6
Snapchat	1433	43.6
Facebook	914	28.0
Twitter	882	26.6
Telegram	142	4.4
Tinder	13	0.4

2.2. Measures

Four direct questions on sexting behaviours were used to assess sexting involvement: sending ("I have sent erotic-sexual videos, images or messages to my boyfriend/girlfriend"); receiving ("I have received erotic-sexual videos, images or messages from my boyfriend/girlfriend"); third-party forwarding ("I have forwarded or shared erotic-sexual videos, images or messages of other boys or girls"); and receiving via an intermediary ("Someone sent me erotic-sexual videos, images or messages of other boys or girls"). The first two questions refer to self-produced sexual content, while the other two questions refer to sexual content of other adolescents. Multiple format responses were used according to the degree of frequency: 0=Never; 1=Rarely; 2=Occasionally (several times/month); 3=Often (several times/week); and 4=Frequently (daily). All variables were dichotomised (0=never engaged; 1=engaged).

Two dimensions of the Normalisation Sexting Questionnaire (NSQ) (Casas et al., 2019) were also used to assess sexting normalisation and willingness to engage in sexting. Specifically, the normalisation dimension comprised five items about the perception of sexting as a normal and usual practice among peers (e.g. "Sending erotic-sexual videos, images or messages is normal, nothing happens") (α=.60). Willingness to engage in sexting was measured using six items that indicate a predisposition to exhibit such behaviours (e.g. "I would send erotic-sexual messages or photos/videos to have fun with my boyfriend/girlfriend") (α=.84). Both dimensions measured the degree of agreement: 0=strongly disagree to 4=strongly agree. Two variables resulted from the average of each dimension.

Respondents were asked to indicate the SNS they used: WhatsApp, Instagram, Twitter, Facebook, Snapchat, Telegram or Tinder. Each variable was dichotomised. Telegram and Tinder were removed given their low use. Regarding sexual orientation, participants had to select the option which most coincided with how they felt in erotic-affective relationships (heterosexual, homosexual, bisexual, asexual). Because of the relatively low prevalence of some sexual orientation categories, the sexual orientation variable was dichotomised. Lastly, a dichotomous item was added to assess whether they had a romantic/sexual partner ("Do you have/Have you had a partner in the last 3 months?").

2.3. Procedure

This study was approved by the Andalusia Biomedical Research Ethics Coordinating Committee (0568-N-14), which follows the guidelines for Good Clinical Practice set by the International Conference on Harmonization. The study adopted a transversal, prospective, single-group ex post facto design (Montero & León, 2007) and incidental sampling was performed. The schools' management teams were contacted by e-mail about participating in a large study on the use of SNS and the potential associated risks. Those schools expressing interest were included in the study. Parental written informed consent was obtained

via acceptance of project participation headed by the respective School Board. Once permissions were obtained, data were collected. Paper-and-pencil questionnaires were administered during class time by either researchers or teachers who had received prior training. During questionnaire administration, respondents were clearly informed about the anonymous and voluntary nature of participation, the confidential treatment of data, and the importance of responding truthfully.

2.4. Data analysis

Data were analysed using SPSS 25.0. Basic descriptive analyses were performed, including Cronbach's alphas and frequencies. Binary logistic regressions were used to assess associations between gender, age, sexual orientation, having a romantic/sexual partner, SNS used, sexting normalisation and willingness to engage in sexting as independent variables, and the four sexting behaviours as dependent variables. Nagelkerke's R^2 was considered as a measure of effect size. All variables were entered into the model simultaneously. The analysis was also stratified by gender.

3. Results

3.1. Prevalence of sexting behaviours

The most frequent sexting behaviours are receiving (21.2%) and receiving via an intermediary (28.4%), followed by third-party forwarding of sexual content (9.3%) and, lastly, sending (8.1%). Descriptive statistics are shown in Table 2.

Table 2. Sexting prevalence based on gender, age, sexual orientation, having a romantic/sexual partner and SNS used				
Variables	**Sending N (%)**	**Receiving N (%)**	**Third-party forwarding N (%)**	**Receiving via an intermediary N (%)**
Gender				
Girl	111 (7.0)	273 (17.1)	100 (6.3)	412 (25.8)
Boy	155 (9.2)	421 (25.1)	205 (12.2)	519 (30.8)
Age				
12	11 (1.5)	71 (9.8)	21 (2.9)	98 (13.5)
13	37 (4.2)	156 (17.8)	58 (6.6)	210 (23.8)
14	92 (11.7)	198 (25.2)	79 (10.0)	243 (30.8)
15	85 (13.2)	174 (27.1)	100 (15.6)	265 (41.3)
16	41 (16.6)	95 (38.6)	48 (19.4)	116 (47.2)
Sexual orientation				
Heterosexual	130 (8.2)	354 (22.3)	150 (9.4)	459 (28.8)
Non-heterosexual	38 (14.1)	59 (21.9)	18 (6.7)	71 (26.3)
Romantic/sexual partner				
No	89 (4.1)	297 (13.6)	142 (6.5)	494 (22.5)
Yes	169 (16.7)	372 (36.9)	156 (15.4)	405 (40.1)
SNS used				
WhatsApp	259 (8.2)	680 (21.5)	302 (9.5)	913 (28.8)
Instagram	249 (9.2)	644 (23.7)	293 (10.8)	859 (31.6)
Twitter	122 (13.9)	253 (28.9)	135 (15.4)	333 (38.0)
Facebook	110 (12.1)	271 (30.0)	133 (14.7)	329 (36.2)
Snapchat	159 (11.1)	359 (25.2)	160 (11.2)	474 (33.2)

3.2. Relationships between sexting behaviours and associated characteristics

The regression models were significant. Nagelkerke's R^2 was .42 for the "sending" model, .29 for the "receiving" model, .23 for the "third-party forwarding" model, and .17 for the "receiving via an intermediary" model (Table 3: https://doi.org/10.6084/m9.figshare.12017964.v1).

In the "sending" model, willingness to sext (OR: 8.26; 95% confidence interval [CI]: 5.36-12.75), having a romantic/sexual partner (OR: 3.44; 95% CI: 2.25-5.25), using Snapchat (OR: 1.87; 95% CI: 1.19-2.93), sexual orientation (OR: 1.77; 95% CI: 1.04-3.00) and age (OR: 1.36; 95% CI: 1.14-1.63) were significantly related to sending engagement. In the "receiving" model, having a romantic/sexual partner (OR: 3.27; 95% CI: 2.51-4.28), willingness to sext (OR: 2.79; 95% CI: 2.01-3.89), using Instagram (OR:

1.89; 95% CI: 1.16-3.10), gender (OR: 1.82; 95% CI: 1.37-2.41), using Snapchat (OR: 1.61; 95% CI: 1.21-2.14), sexting normalisation (OR: 1.49; 95% CI: 1.20-1.86) and age (OR: 1.26; 95% CI: 1.12-1.41) were significantly related to receiving engagement.

In the "third-party forwarding" model, using Instagram (OR: 2.74; 95% CI: 1.16-6.51), willingness to sext (OR: 2.00; 95% CI: 1.48-2.72), gender (OR: 1.96; 95% CI: 1.32-2.91), having a romantic/sexual partner (OR: 1.86; 95% CI: 1.29-2.68), using Facebook (OR: 1.53; 95% CI: 1.03-2.26), sexting normalisation (OR: 1.43; 95% CI: 1.09-1.87) and age (OR: 1.43; 95% CI: 1.22-1.66) were significantly related to engagement in third-party forwarding.

In the "receiving via an intermediary" model, using Instagram (OR: 2.16; 95% CI: 1.47-3.19), sexting normalisation (OR: 1.84; 95% CI: 1.52-2.24), having a romantic/sexual partner (OR: 1.71; 95% CI: 1.35-2.17), gender (OR: 1.41; 95% CI: 1.11-1.80) and age (OR: 1.36; 95% CI: 1.23-1.49) were significantly related to engagement in receiving via an intermediary.

3.3. Gender differences

The regression models were significant. Nagelkerke's R^2 was .50 for girls and .41 for boys for the "sending" model; .31 for girls and .29 for boys for the "receiving" model; .18 for girls and .24 for boys for the "third-party forwarding" model; and .14 for girls and .22 for boys for the "receiving via an intermediary" model (Table 4: https://doi.org/10.6084/m9.figshare.12017964.v1).

In the "sending" model, for girls, willingness to sext (OR: 30.44; 95% CI: 11.93-77.68), having a romantic/sexual partner (OR: 4.54; 95% CI: 2.27-9.09) and age (OR: 1.60; 95% CI: 1.17-2.20) were significantly related to sending engagement. For boys, these were willingness to sext (OR: 6.05; 95% CI: 3.68-9.94), having a romantic/sexual partner (OR: 2.79; 95% CI: 1.59-4.88) and using Snapchat (OR: 2.38; 95% CI: 1.32-4.29).

In the "receiving" model, for girls, willingness to sext (OR: 5.11; 95% CI: 2.57-10.16), using Instagram (OR: 4.34; 95% CI: 1.43-13.14), having a romantic/sexual partner (OR: 3.77; 95% CI: 2.49-5.72), sexting normalisation (OR: 1.62; 95% CI: 1.13-2.33) and age (OR: 1.42; 95% CI: 1.17-1.72) were significantly related to receiving engagement. For boys, these were having a romantic/sexual partner (OR: 2.97; 95% CI: 2.08-4.25), willingness to sext (OR: 2.32; 95% CI: 1.58-3.41), using Snapchat (OR: 2.03; 95% CI: 1.38-2.91), sexting normalisation (OR: 1.40; 95% CI: 1.06-1.86) and age (OR: 1.20; 95% CI: 1.04-1.38).

In the "third-party forwarding" model, for girls, willingness to sext (OR: 1.98; 95% CI: 1.14-3.44), using Facebook (OR: 1.98; 95% CI: 1.01-3.91), having a romantic/sexual partner (OR: 1.91; 95% CI: 1.02-3.55), sexting normalisation (OR: 1.74; 95% CI: 1.06-2.86) and age (OR: 1.38; 95% CI: 1.03-1.84) were significantly related to engagement in third-party forwarding. For boys, these were using Instagram (OR: 3.08; 95% CI: 1.07-8.88), willingness to sext (OR: 2.08; 95% CI: 1.42-3.03), having a romantic/sexual partner (OR: 1.79; 95% CI: 1.13-2.83) and age (OR: 1.42; 95% CI: 1.18-1.71).

In the "receiving via an intermediary" model, for girls, using Instagram (OR: 2.63; 95% CI: 1.39-4.95), sexting normalisation (OR: 1.53; 95% CI: 1.14-2.07), having a romantic/sexual partner (OR: 1.50; 95% CI: 1.06-2.12) and age (OR: 1.42; 95% CI: 1.21-1.65) were significantly related to engagement in receiving via an intermediary. For boys, these were sexting normalisation (OR: 2.17; 95% CI: 1.66-2.83), using Instagram (OR: 1.88; 95% CI: 1.15-3.09), having a romantic/sexual partner (OR: 1.86; 95% CI: 1.32-2.60), using Snapchat (OR: 1.57; 95% CI: 1.11-2.24) and age (OR: 1.33; 95% CI: 1.17-1.52).

4. Discussion and conclusions

This study advances knowledge of sexting, going beyond sending and receiving to also encompass the forwarding of a personally received sext and the further transmission of a third-party sexting message. According to previous research (Barrense-Dias et al., 2017), sexting behaviours that refer to passive attitudes (receiving and receiving via an intermediary) are more frequent than active forms (sending and third-party forwarding). Specifically, more than 2 in 25 teenagers send or forward sexual content, while more than 1 in 5 receive it directly from the creator, and more than 1 in 4 teenagers receive it via an intermediary. Although the prevalence rates in this study for sending, receiving and third-party forwarding are slightly lower than the average observed in Madigan et al.'s (2018) meta-analysis, the rate of

receiving a forwarded sext is considerably higher. In addition, typically non-consensual sexting behaviours are more frequent than typically consensual ones. This coincides with Villacampa's (2017) study in which the third-party forwarding of sexual content was more frequent than its production. Therefore, these results emphasise the need for educational efforts to focus more on promoting respect for privacy, consent and the promotion of sexual ethics (Dobson & Ringrose, 2016; Wurtele & Miller-Perrin, 2014). Educational programmes should seek to develop skills for maintaining an ethically intimate relationship, such as preventing pressure in a sexual-affective relationship; encouraging reflection on the importance of actual consent and respect for one's partner; and maintaining a critical attitude towards the exchange of non-consensual sexual content (Albury et al., 2017).

The relative importance attached to each analysed variable is shown to depend on the specific sexting behaviour and the participants' gender. Although boys engage more than girls across all sexting behaviours, sending is the only behaviour not predicted by gender. These results coincide with studies that claim no gender differences in sending (Beckmeyer et al., 2019; Campbell & Park, 2014). From this perspective, Symons et al. (2018) highlight that whereas girls may perceive themselves as less likely to send sexual content than boys, they generally seem to send content of this kind in a similar way. This suggests a conflict between the expectations that girls hold about themselves and their actual behaviour. However, gender differences in engagement are observed in all other behaviours (Madigan et al., 2018). For both boys and girls, sexting is an invitation to participate in sexual activities (Wurtele & Miller-Perrin, 2014), but in general boys hold more favourable attitudes towards sexting than girls (Gewirtz-Meydan et al., 2018). As such, the results support studies that suggest girls are more involved as victims in sexting, suffering the negative consequences of this phenomenon (Dobson & Ringrose, 2016; Symons et al., 2018). This may be because boys are more likely to practice sexting in ways that are deemed riskier for their partner than for themselves, that is, receiving and forwarding to third parties. This supports previous literature that claims sexting is not a gender neutral activity (Wood et al., 2015). Therefore, educational efforts should also focus on promoting gender equality and healthy relationships (Dobson & Ringrose, 2016; Wurtele & Miller-Perrin, 2014). It is particularly important to discuss with young people the sexual double standard and to avoid the use of gender stereotypes when devising and implementing strategies to tackle sexting (Döring, 2014; Wood et al., 2015).

Age is related to all sexting behaviours, except sending in boys. This coincides with previous studies (Gámez-Guadix et al., 2017; Madigan et al., 2018) and may be due to adolescents' increasing social network usage with age (Garmendia et al., 2016) and the emergence of their first romantic/sexual relationships as a natural and normative development in adolescence (Lantagne & Furman, 2017). In the case of third-party forwarding of sexts, this could also mean a greater risk of sexting messages being disseminated non-consensually over the course of adolescence (Ringrose et al., 2013). Thus, educational efforts should be made to promote sexual education early on (Ahern et al., 2016; Gámez-Guadix et al., 2017). Although sexting is less frequent among very young or preteen boys and girls, negative outcomes are more common in these groups (Englander, 2019).

Sexual orientation predicts involvement in sending sexts. Specifically, adolescents who identify as non-heterosexual participate more in this practice, but not in other behaviours. This coincides with previous research reporting how young people from sexual minorities are more likely to engage in sending sexual content (Gámez-Guadix et al., 2017; Ybarra & Mitchell, 2014). However, the aforementioned groups are not significantly more likely to participate in other sexting behaviours more closely related to non-consensual forms (Van-Ouytsel et al., 2019). The higher prevalence of sending sexts could potentially be explained by the fact that the digital environment allows individuals, especially young people from sexual minorities, to connect with potential dating partners without fear of negative social repercussions (Brown et al., 2005).

Having or having had a romantic/sexual partner in the last three months predicts involvement across all sexting behaviours for both boys and girls. This coincides with previous studies reporting how sexting occurs more often between desired and actual sexual and/or romantic partners (Wood et al., 2015). In Beckmeyer et al.'s (2019) study, 84.1% of the adolescents participating in sexting were in a romantic relationship. Thus, sexting can not only lead to negative outcomes, such as the future dissemination of non-consensual sexual content, but it can also have a positive impact, such as strengthening a romantic

relationship (Englander, 2019). In general terms, the literature to date has focused more on the phenomenon's negative consequences than on accepting it as a new form of intimate online relationships and preventing its possible negative effects (Döring, 2014). Society must accept sexting as a new way of exploring one's sexuality in keeping with contemporary times, and educate so that those engaging in such behaviours practice "safe sexting", thus making them jointly responsible for their safety and allowing them to take safe measures to protect themselves (Villacampa, 2017). Incorporating sexting into sex education programmes is a key part of addressing this phenomenon (Van-Ouytsel et al., 2014).

Regarding the use of SNS, Snapchat predicts the sending and receiving of sexts; Facebook predicts third-party forwarding; and Instagram predicts third-party forwarding, receiving and receiving via an intermediary. Snapchat seems to be the most commonly used SNS for sending and receiving sexts, while Instagram is used for the other sexting behaviours more strongly. However, this varies by gender. In girls, sending is not predicted by any SNS, whereas other behaviours are predicted by the use of Instagram. In boys, sending and both types of receiving are predicted by the use of Snapchat, while Instagram is used for third-party forwarding and receiving via an intermediary and Facebook also for receiving. In general terms, the Snapchat platform is used more to exchange consensual sexual content between romantic/sexual partners, although a study of whether factors including pressure and coercion exert an influence is needed. In contrast, Facebook and Instagram are more frequently used for generally non-consensual forms of sexting. Specifically, the third-party forwarding of sexual content can be classed as a form of sexting with the highest risk because the content can be spread more easily and reach the target audience without consent (Madigan et al., 2018). When it comes to preventive actions, attention needs to be paid to these platforms as channels for disseminating non-consensual sexual content. Developing a safe and healthy use of the Internet and social networks is essential, highlighting, for example, the control of personal information online (Patrick et al., 2015) as well as an understanding of the rights and responsibilities surrounding digital technologies and virtual social networks (Gámez-Guadix et al., 2017). The "Asegúrate" programme (Del-Rey et al., 2019) is an example of a psychoeducational programme developed for this purpose and which comprehensively addresses phenomena such as sexting, cyberbullying and bullying.

Lastly, sexting normalisation increases the likelihood of practicing all sexting behaviours, except sending. Furthermore, in boys, it does not predict third-party forwarding. This study reports considerable prevalence rates across the different sexting behaviours; however, they do not allow them to be considered as normative practices (Van-Ouytsel et al., 2015). Although sexting is becoming increasingly more normalised (Stanley et al., 2018), this would support the theory that adolescents perceive certain norms of sexting but do not necessarily apply them to themselves (Symons et al., 2018). These beliefs about how normalised sexting is may influence willingness to participate (Lippman & Campbell, 2014). Specifically, the willingness to engage in sexting is what best predicts sexting participation in most cases, except when it comes to receiving via an intermediary in both boys and girls.

Furthermore, the predictive value of girls' willingness to participate in sending and receiving is especially prominent. It may be that sexting normalisation is indirectly driving an increased predisposition to participate in sexting, with the latter increasing the prevalence of sending, receiving and forwarding sexual content. In fact, the subjective norm is the strongest predictor of young people's sexual intention (Walrave et al., 2015). Although the sharing of sexual content is far from normative behaviour, it is sufficiently widespread and standardised, meaning that education and prevention initiatives to combat its potential consequences, especially non-consensual sharing, are strongly justified (Mitchell et al., 2012). However, messages based on fear are not effective (Stanley et al., 2018). Many teenagers already have an idea of the phenomenon's negative effects, and a warning or ban alone would fail to prevent the possible consequences (Lim et al., 2016). A better approach may be to focus on social norming approaches, acknowledging that not all adolescents sext and, excluding non-consensual sexting behaviours, everyone is free to decide whether to engage or not (Englander, 2019).

Some limitations should be borne in mind when interpreting the results. It is necessary to consider the use of convenience sampling and the cross-sectional nature of our data. Similarly, self-report instruments carry the risk of obtaining socially desirable or imprecise responses. However, this proves controversial given that different variables and measures can impact on how much variance is actually

shared (Richardson et al., 2009), and independently recording and verifying sexting behaviours would be extremely challenging. Furthermore, the normalisation dimension of sexting has acceptable yet not very high reliability, and it could come into play with the cultural context, that is, a country's culture and education system may impose fewer or greater social penalisations for sharing sexual content.

This study did not look at whether the sent sexual content was later forwarded non-consensually or whether said content was forwarded between (ex)romantic partners. Future lines of research could address these limitations and expanding on the factors that may explain adolescent sexting involvement. Qualitative studies would be useful for gaining a more detailed understanding of the characteristics associated with each sexting behaviour and gender-related differences. Another necessary step would be to design, implement and evaluate educational school-based programmes aimed at addressing the potential negative consequences of sexting, considering the different sexting behaviours observed and their traits.

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References

Ahern, N.R., Kemppainen, J., & Thacker, P. (2016). Awareness and knowledge of child and adolescent risky behaviors: A parent's perspective. *Journal of Child and Adolescent Psychiatric Nursing*, *29*(1), 6-14. https://doi.org/10.1111/jcap.12129

Albury, K., Hasinoff, A.A., & Senft, T. (2017). From media abstinence to media production: Sexting, young people and education. In Allen, L., & Rasmussen, M. (Eds.), *The palgrave handbook of sexuality education* (pp. 527-545). Palgrave Macmillan UK. https://doi.org/10.1057/978-1-137-40033-8_26

Barrense-Dias, Y., Berchtold, A., Surís, J.C., & Akre, C. (2017). Sexting and the definition issue. *Journal of Adolescent Health*, *61*(5), 544-554. https://doi.org/10.1016/j.jadohealth.2017.05.009

Beckmeyer, J.J., Herbenick, D., Fu, T.C.J., Dodge, B., Reece, M., & Fortenberry, J.D. (2019). Characteristics of adolescent sexting: Results from the 2015 national survey of sexual health and behavior. *Journal of Sex & Marital Therapy*, *45*(8), 767-780. https://doi.org/10.1080/0092623x.2019.1613463

Brown, G., Maycock, B., & Burns, S. (2005). Your picture is your bait: Use and meaning of cyberspace among gay men. *Journal of Sex Research*, *42*(1), 63-73. https://doi.org/10.1080/00224490509552258

Campbell, S.W., & Park, Y.J. (2014). Predictors of mobile sexting among teens: Toward a new explanatory framework. *Mobile Media & Communication*, *20*(1), 20-39. https://doi.org/10.1177/2050157913502645

Casas, J.A., Ojeda, M., Elipe, P., & Del-Rey, R. (2019). Exploring which factors contribute to teens' participation in sexting. *Computers in Human Behavior*, *100*, 60-69. https://doi.org/10.1016/j.chb.2019.06.010

Davidson, J. (2015). *Sexting: Gender and teens*. Springer. https://bit.ly/3doq176

Del-Rey, R., Ortega-Ruiz, R., & Casas, J. (2019). 'Asegúrate': An Intervention program against cyberbullying based on teachers' commitment and on design of its instructional materials. *International Journal of Environmental Research and Public Health*, *16*(3), 434-434. https://doi.org/10.3390/ijerph16030434

Dobson, A.S., & Ringrose, J. (2016). Sext education: Pedagogies of sex, gender and shame in the schoolyards of tagged and exposed. *Sex Education*, *16*, 8-21. https://doi.org/10.1080/14681811.2015.1050486

Döring, N. (2014). Consensual sexting among adolescents: Risk prevention through abstinence education or safer sexting? *Cyberpsychology*, *8*(1). https://doi.org/10.5817/cp2014-1-9

Englander, E. (2019). What do we know about sexting, and when did we know it? *Journal of Adolescent Health*, *65*(5), 577-578. https://doi.org/10.1016/j.jadohealth.2019.08.004

Gámez-Guadix, M., De-Santisteban, P., & Resett, S. (2017). Sexting among Spanish adolescents: Prevalence and personality profiles. *Psicothema*, *29*(1), 29-34. https://doi.org/10.7334/psicothema2016.222

Garmendia, M., Jiménez, E., Casado, M.A., & Mascheroni, G. (2010). *Net children go mobile: Riesgos y oportunidades en Internet y el uso de dispositivos móviles entre menores españoles (2010-2015)*. Universidad del País Vasco/Red.es. https://bit.ly/2viYYc2

Gewirtz-Meydan, A., Mitchell, K.J., & Rothman, E.F. (2018). What do kids think about sexting? *Computers in Human Behavior*, *86*, 256-265. https://doi.org/10.1016/j.chb.2018.04.007

Lantagne, A., & Furman, W. (2017). Romantic relationship development: The interplay between age and relationship length. *Developmental Psychology*, *53*(9), 1738-1749. https://doi.org/10.1037/dev0000363

Lim, M.S.C., Vella, A.M., Horyniak, D.R., & Hellard, M.E. (2016). Exploring attitudes towards sexting of young people: A cross-sectional study. *Sexual Health*, *13*(6), 530-530. https://doi.org/10.1071/sh16029

Lippman, J.R., & Campbell, S.W. (2014). Damned if you do, damned if you don't… If you're a girl: Relational and normative contexts of adolescent sexting in the United States. *Journal of Children and Media*, *8*(4), 371-386. https://doi.org/10.1080/17482798.2014.923009

Madigan, S., Ly, A., Rash, C.L., Ouytsel, J.V., & Temple, J.R. (2018). Prevalence of multiple forms of sexting behavior among youth. *JAMA Pediatrics*, *172*(4), 327-327. https://doi.org/10.1001/jamapediatrics.2017.5314

Marume, A., Maradzika, J., & January, J. (2018). Adolescent sexting and risky sexual behaviours in zimbabwe: A cross-sectional study. *Sexuality & Culture*, *22*(3), 931-941. https://doi.org/10.1007/s12119-018-9508-4

McEachern, A., McEachern-Ciattoni, R., & Martin, F. (2012). Sexting: New challenges for schools and professional school counselors. *Journal of School Counseling*, *10*(20), 1-28. https://bit.ly/2ZdoQk6

Medrano, J.L.J., Rosales, F.L., & Gámez-Guadix, M. (2018). Assessing the links of sexting, cybervictimization, depression, and suicidal ideation among university students. *Archives of Suicide Research*, *22*(1), 153-164. https://doi.org/10.1080/13811118.2017.1304304

Mitchell, K.J., Finkelhor, D., Jones, L.M., & Wolak, J. (2012). Prevalence and characteristics of youth sexting: A national study. *Pediatrics*, *129*(1), 13-20. https://doi.org/10.1542/peds.2011-1730

Montero, I., & León, O.G. (2007). A guide for naming research studies in Psychology. *International Journal of Clinical and Health Psychology*, *7*(3), 847-862. https://bit.ly/2wVCuhY

Olivari, M., & Confalonieri, E. (2017). Adolescenti e sexting: Una review della letteratura. *Maltrattamento e Abuso All'infanzia*, *2*, 119-140. https://doi.org/10.3280/mal2017-002007

Patrick, K., Heywood, W., Pitts, M.K., & Mitchell, A. (2015). Demographic and behavioural correlates of six sexting behaviours among Australian secondary school students. *Sexual Health*, *12*(6), 480-480. https://doi.org/10.1071/sh15004

Richardson, H.A., Simmering, M.J., & Sturman, M.C. (2009). A tale of three perspectives: Examining post hoc statistical techniques for detection and correction of common method variance. *Organizational Research Methods*, *12*(4), 762-800. https://doi.org/10.1177/1094428109332834

Ringrose, J., Harvey, L., Gill, R., & Livingstone, S. (2013). Teen girls, sexual double standards and 'sexting': Gendered value in digital image exchange. *Feminist Theory*, *14*(3), 305-323. https://doi.org/10.1177/1464700113499853

Schmitz, S., & Siry, L. (2011). Teenage folly or child abuse? State responses to 'sexting' by minors in the U.S. and Germany. *Policy & Internet*, *3*(2), 25-50. https://doi.org/10.2202/1944-2866.1127

Stanley, N., Barter, C., Wood, M., Aghtaie, N., Larkins, C., Lanau, A., & Överlien, C. (2018). Pornography, Sexual coercion and abuse and sexting in young people's intimate relationships: A European study. *Journal of Interpersonal Violence*, *33*(19), 2919-2944. https://doi.org/10.1177/0886260516633204

Strassberg, D.S., Cann, D., & Velarde, V. (2017). Sexting by High school students. *Archives of Sexual Behavior*, *46*(6), 1667-1672. https://doi.org/10.1007/s10508-016-0926-9

Symons, K., Ponnet, K., Walrave, M., & Heirman, W. (2018). Sexting scripts in adolescent relationships: Is sexting becoming the norm? *New Media & Society*, *20*(10), 3836-3857. https://doi.org/10.1177/1461444818761869

Van-Ouytsel, J., Walrave, M., & Ponnet, K. (2019). An exploratory study of sexting behaviors among heterosexual and sexual minority early adolescents. *Journal of Adolescent Health*, *65*(5), 621-626. https://doi.org/10.1016/j.jadohealth.2019.06.003 Van-Ouytsel, J., Walrave, M., Ponnet, K., & Heirman, W. (2015). The Association between adolescent sexting, psychosocial difficulties, and risk behavior. *The Journal of School Nursing*, *31*(1), 54-69. https://doi.org/10.1177/1059840514541964

Van-Ouytsel, J., Walrave, M., & Van-Gool, E. (2014). Sexting: Between thrill and fear-how schools can respond. *The Clearing House*, *87*, 204-212. https://doi.org/10.1080/00098655.2014.918532

Villacampa, C. (2017). Teen sexting: Prevalence, characteristics and legal treatment. *International Journal of Law, Crime and Justice*, *49*, 10-21. https://doi.org/10.1016/j.ijlcj.2017.01.002

Walrave, M., Ponnet, K., Ouytsel, J.V., Gool, E.V., Heirman, W., & Verbeek, A. (2015). Whether or not to engage in sexting: Explaining adolescent sexting behaviour by applying the prototype willingness model. *Telematics and Informatics*, *32*(4), 796-808. https://doi.org/10.1016/j.tele.2015.03.008

West, J.H., Lister, C.E., Hall, P.C., Crookston, B.T., Snow, P.R., ... West, R.P. (2014). Sexting among peruvian adolescents. *BMC Public Health*, *14*(1). https://doi.org/10.1186/1471-2458-14-811

Wood, M., Barter, C., Stanley, N., Aghtaie, N., & Larkins, C. (2015). Images across Europe: The sending and receiving of sexual images and associations with interpersonal violence in young people's relationships. *Children and Youth Services Review*, *59*, 149-160. https://doi.org/10.1016/j.childyouth.2015.11.005

Wurtele, S., & Miller-Perrin, C. (2014). Preventing technology-initiated sexual victimization of youth: A developmental perspective. In Kenny, M.C. (Ed.), *Sex education: Attitude of adolescents, cultural differences and schools' challenges* (pp. 147-175). Nova. https://bit.ly/2UItJjB

Ybarra, M.L., & Mitchell, K.J. (2014). 'Sexting' and its relation to sexual activity and sexual risk behavior in a national survey of adolescents. *Journal of Adolescent Health*, *55*(6), 757-764. https://doi.org/10.1016/j.jadohealth.2014.07.012

Childhood use of mobile devices: Influence of mothers' socio-educational level

Uso infantil de dispositivos móviles: Influencia del nivel socioeducativo materno

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ABSTRACT

The presence and variety of mobile devices in Spanish homes, regardless of the social and economic con-text, has been widespread for years. Several studies focus on parental mediation in children's consumption of smart devices, however, there is a lack of scientific evidence about how the educational level and the professional profile of parents affect children's digital media consumption. This study analyzes the influence of the socio-educational level of families on the consumption of digital screens. The study deepens the understanding on the educational level of parents, as well as their professional category. A quantitative methodology was applied on a sample of 792 primary school children, between 5 and 9 years of age, in three Spanish cities. The consumption of television, smartphones, tablets, computers and videogames was analyzed. Results indicate that, the lower the level of education and professional category of the mother, the greater the consumption of content through smart devices by children. The study demonstrates, therefore, the importance of considering the educational and professional levels of mothers and fathers for a better understanding of the consumption of digital screens and, at the same time, as an opportunity for designing family strategies that encourage critical thinking and digital media education.

RESUMEN

La presencia y la variedad de dispositivos móviles en los hogares españoles, con independencia del contexto social y económico, es una realidad normalizada desde hace años. Diversos estudios se centran en la mediación parental en el consumo infantil de pantallas inteligentes, aunque existe una falta de evidencia científica sobre cómo el nivel de formación y el perfil profesional de las madres y de los padres inciden en las formas de consumo mediático digital de los menores. Este estudio analiza la influencia del nivel socioeducativo de las familias en el consumo de pantallas inteligentes. La investigación profundiza en el nivel de estudios de madres y padres, así como en su categoría profesional. Para ello se utiliza una metodología cuantitativa a partir de una muestra de 792 niños y niñas de primaria, de entre 5 y 9 años, de tres ciudades españolas. Se analiza el consumo de televisión, teléfonos móviles, tabletas, ordenadores y videojuegos. Los resultados señalan que, a menor nivel de estudios y menor categoría profesional de la madre, mayor es el consumo de contenidos a través de dispositivos móviles por parte de los menores. El estudio demuestra la importancia de considerar el nivel educativo y profesional de las madres y de los padres como oportunidad para entender mejor el consumo de pantallas inteligentes y para diseñar estrategias familiares que fomenten el pensamiento crítico y la educación mediática digital.

KEYWORDS | PALABRAS CLAVE

Mobile devices, smart screens, children, mothers, social level, parental intervention, opportunities, media consumption.
Dispositivos móviles, pantallas inteligentes, niños, madres, nivel social, mediación parental, oportunidades, consumo mediático.

1. Introduction and state of the art

Our media environment is changing rapidly, and this reality also influences children (Livingstone & Haddon, 2009). According to data from the Association for Media Research (AIMC for its initials in Spanish) (2018, 2019), Spanish children between the ages of 6 and 13 spend almost five hours a day in front of a screen on weekdays and seven on weekends. There is also a high number of technological equipment in Spanish households, which have an average of seven technological devices; and, of these, minors use an average of four.

Although today's children are growing up with an abundance of media devices and are exposed to a wide range of digital resources, this does not necessarily mean that they are frequent or exclusive users, and while they may have a predisposition to play videogames or watch videos, they also enjoy other non-digital activities (Chaudron et al., 2015).

1.1. Smart screen consumption among children

Data from the National Telecommunications and Information Society Observatory (ONTSI for its initials in Spanish) (2019a, b) on child and adolescent consumption of mobile devices focus on the 10-15 age group without providing consumption information for younger children. In the age group covered by the report, there is widespread use of technology, especially computers (92.2% of girls and 90.4% of boys) and mobile phones (71.6% of girls and 68.2% of boys). Internet use is virtually universal for these ages (92.8 %, with negligible gender variation, 93.2 % for girls and 92.5 % for boys). This use was mainly made from their own home, which represented 94.9% of the locations where these minors were connected. For younger age groups, we have the AIMC report (2018), which states that 89% of children aged 6 to 13 consume videos on the Internet and 36% do so daily.

On the other hand, it should be noted that children combine traditional and emerging technologies in their lives (Mullan, 2018), and there is a need to assess the impact of technology on their well-being and their degree of digital literacy. In this sense, several authors claim that digital literacy is a combination of knowledge, skills, attitudes and, above all, a "social practice" (Buckingham, 2007; Livingstone & Haddon, 2009). This media convergence, together with its ease of access, provides the least opportunities for sociability, self-expression, learning, creativity and participation through online and mobile media (Garmendia et al., 2016).

Although studies on the use of digital media by children in the first cycle of primary school are scarce and mostly conducted with North American children (Lauricella et al, 2015), there is a great deal of research analyzing the effects of digital media consumption on children's well-being: exposure to and use of these devices has been studied among preschool children (Dashti & Yateem, 2018; Kiliç et al., 2019) as well as among pre-adolescents and adolescents (Garmendia et al., 2016), the impact of this consumption on their physical and mental well-being has also been assessed (Bozzola et al., 2018). In this sense, studies such as that of Fajardo-Bullón et al. (2019) and El-Asam et al. (2019) among others, address tools for intervention in the problematic use of the Internet among children in the first and second cycles of primary school.

1.2. Parental mediation and family socioeconomic level in the use and consumption of screens

Children's consumption of screens and their time of use seems to be highly influenced by parents' attitudes (Sanchez et al., 2017). It has been found that children's media skills and activities are more related to their parents' mediation style than to the age of the child (Nikken & Schols, 2015; Sanchez et al., 2017). It has also been concluded that the socioeconomic level of families affects the use and value placed on time, and that these beliefs condition the behavior allowed to minors in their relationship with smart screens (Correa, 2015; Katz et al., 2018). Previous studies suggest that those responsible for formulating policies aimed at improving children's use of screens should consider the family environment as a whole (Berríos et al., 2015; Lauricella et al., 2015), making it necessary to incorporate the interrelationship between the type of parental mediation and the family's socioeconomic level in the design of measures.

Parental mediation refers to the set of strategies that parents use to control, supervise or interpret the content of media to which children are exposed (Warren, 2001). These mediation strategies can be

of three types: restrictive, social or active (Nikken & Jansz, 2006). In the restrictive mediation strategy, adults set rules about the amount of time and content allowed, without talking to the child about it. In the case of the social mediation strategy, the content is discussed informally, but without helping to reflect on it. Active mediation is evaluative and/or instructive, and the child is guided to understand the content in order to educate him/her about the things that happen, either during or after consuming media (Kuo et al., 2015). The adoption of strategies does not necessarily imply parental control while children are surfing the Internet. Although today's children are in contact with a wide range of digital tools from a very young age, this does not mean that they have the right criteria for selecting and evaluating information. Thus, although many families establish rules for Internet use, parents are not always present to verify compliance with those rules and in that sense, those "digital natives" become "digital orphans", since they do not manage to process all the information provided by the Internet correctly (Novoa, 2017; Ponce-de-León et al., 2016).

Studies conducted in different cultural contexts (Hargittai 2010; Valcke et al., 2010; Määttä et al., 2017) have found that families with high socioeconomic status tend to see media exposure as something that needs careful regulation and allocation (which would speak of an active mediation style), and that it is the mother who is most attentive to exercising such regulation, especially when the child is younger (Jiménez-Iglesias et al., 2015). Accordingly, the main objective of this study is to find out the impact that the level of education and professional profile of mothers and fathers has on the use and type of consumption of digital devices by children aged 5 to 9. As there is no previous research correlating the mentioned variables, the results of this study will be useful to public administrations in the development of digital literacy policies aimed at families, especially the most vulnerable ones in terms of socioeconomic status.

2. Material and method

2.1. Design

The research design was cross-sectional quantitative.

2.2. Procedure

With the permission of collaborating schools, a consent form was sent to parents between March and December 2017, informing them of the objectives of the study. The informed consent itself asked parents to confirm their educational background and current profession. Once the informed consent forms were collected, a date was set with the schools for the completion of the questionnaire. The questionnaire was administered on a case-by-case basis. The final sample of completed questionnaires was 792, guaranteeing confidentiality and anonymity of the data obtained at all times.

2.3. Sample

A convenience sample of 792 primary school students from 15 schools (five publics, nine subsidized and one private) in three Spanish cities was used (196 students in Barcelona, 320 in Madrid and 276 in Seville). Convenience sampling was applied by prioritizing the ecological validity of the study, i.e. the external validity of the situation, and not the random representativeness of the sample (external population validity). Therefore, those centers that provided better accessibility conditions were selected. Of the 792 participating schoolchildren, 429 were girls (54.2%) and 363 were boys (45.8%). The average age was 7.23 years and the median age was 7. The minimum and maximum correspond to 5 and 9 years, respectively.

The methodology used in the baseline research (Chaudron et al., 2015; Livingstone et al., 2018), promoted by the European Commission, and based on the responses of 70 families, distributed in 10 countries, was considered. The sample, in this case, is also non-probabilistic and convenience, chosen according to a broad criterion: "The core of the sample is formed by families with children under 8 with at least one parent and at least one child of age 6-7 who use a digital technology regularly, i.e., at least once a week" (Chaudron et al., 2015: 22).

2.4. Measuring instruments

An inductive-deductive method was used for data processing with a quantitative approach. An ad hoc questionnaire was developed –Mediacorp questionnaire: adaptation of the Body Image Questionnaire (QÜIC) to the child population by Penelo et al. (2012)– which collects six blocks of information: sociodemographic data of the child and his/her family; media consumption; satisfaction with his/her own body image; projection of the ideal body image for the opposite sex; and, finally, the child's Body Mass Index (BMI). For the purposes of this article, the focus was placed on data obtained from the first two blocks of the questionnaire (i.e., sociodemographic data on children and their families and media consumption, based on the adaptation by Velarde (1992) and Medrano et al. (2015). An initial version of the questionnaire was applied to a first-grade class as a pilot test and the necessary adjustments were made to facilitate understanding of the questions and the answer format according to the reading ability levels of 6-year-olds.

As mentioned earlier, the sociodemographic data of the students' parents were collected in the informed consent document. To avoid heteronormative biases, the specific formulation allowed for the possibility that only one option was marked (only father or only mother) as well as two fathers or two mothers. In the same document, the educational level of the mother and father was requested, following three levels: 1) Low level (no studies, primary studies); 2) Medium level (Secondary studies, Vocational training, Baccalaureate studies); 3) High level (Upper middle level, Upper university level, Master's/Doctorate). They were also asked about their professional category, organized into three levels: 1) High professional category (for example: directors and managers of establishments with 10 or more employees and professionals traditionally associated with university degrees); 2) Medium professional category (for example: administrative-type employees and support professionals for administrative management and other services); 3) Low professional category (for example: semi-skilled or unskilled workers).

The item in the questionnaire that referred to media consumption was part of the broader list of topics surveyed. Specifically, it followed the following formulation: 'When you are at home, what do you do?' and offered eight answer possibilities (choice of three from highest to lowest frequency): 1) Playing videogames; 2) Reading magazines/comics; 3) Using the computer; 4) Using the mobile phone; 5) Watching TV; 6) Using the tablet; 7) Reading books; 8) None of the above.

3. Analysis and results

A bivariate analysis was performed on the variables 'playing videogames', 'using the computer', 'using the mobile phone', 'watching TV', and 'using the tablet'; according to the following variables: 'mother's studies', 'father's studies', 'mother's professional category', and 'father's professional category'.

The descriptive statistics used were the following: contingency tables between the different media consumption variables and the characteristics of the child. As for inferential statistics, the Chi-square test or likelihood ratio test were performed, as appropriate. For all tests, the significance level was set at 5%. The analyses were conducted using the following software: SAS v9.4, SAS Institute Inc, Cary, NC, USA.

3.1. Sociodemographic data on the mothers and fathers of the sample members

Of the total 749 mothers (41 years on average), 55.81% (N=418) of the sample of mothers had a higher level of education, followed by 37.25% (N=279) with a medium level and 6.94% (N=52) reported having a low level of education. In terms of their professional category, 56.42% (N=400) had a medium professional category, 29.48% (N=209) had a high professional category, and 14.10% (N=100) had a low professional category.

Of the 622 fathers (43 years on average), 50.88% (N=317) had a higher level of education, 36.60% (N=228) had a medium level of education, and 12.52% (N=78) reported low levels of education. In terms of their professional category, 48.76 (N=296) had a medium professional category, 36.90 (N=224) had a high professional category, and 14.33% (N=87) had a low professional category.

3.2. Media consumption by children in the sample

The results indicate that television continues to be the most consumed medium among children in the sample analyzed. It is consumed by 69.8% of them. It was followed by tablets (50.9%), videogames (33.8%), mobile phones (30.3%) and computers (26.5%).

Television is consumed by 7 out of 10 children. By gender, we found that consumption is fairly balanced, at 71.6 % in boys and 68.3 % in girls. According to the educational level of their parents, it is worth noting that there is a lower television consumption as the educational level of the mother increases (Table 1). This trend is also observed in the level of studies of the father (Table 2). A decrease in television consumption stands out as the professional category of the parents increases.

Tablets are used by 50.9 % of girls aged 5-9 years. By gender, 47.1% of girls and 55.4 % of boys use tablets. Taking into account the mother's level of education, higher consumption is observed at low educational levels. According to the father's level of education, the highest consumption is at the middle level of education. It can be seen that the professional category of the mother influences the use of the tablet by the children, with a higher use in the lower professional categories. By analyzing the professional category of the father, it was observed that the offspring of the middle category consumed tablets the most.

Videogames are consumed by 33.8% of this group. By gender, male gaming stood out at 53.7%. In contrast, only 17% of the girls in the study played videogames. According to the level of studies for both the mother and the father, a greater consumption was observed at lower levels of education. Considering the professional category of the parents, a greater consumption was observed at lower professional categories.

Mobile phones were used by 30.3% of these minors. By gender, more male consumption was observed (35.8%) than female consumption (25.6%). Considering the level of education of the parents, important differences were observed. The higher the level of education, the lower the consumption of mobile phones.

Table 1. Comparison of media consumption of children analyzed according to their mother's educational level and professional category							
Device	Total	Educational level of the mother			Professional category of the mother		
		High	Medium	Low	High	Medium	Low
Television	69.8%	64.8%	76.0%	78.9%	67.0%	71.5%	73.0%
Tablet	50.9%	49.0%	53.8%	53.9%	47.9%	53.3%	57.0%
Videogames	33.8%	32.5%	33.7%	36.5%	29.2%	33.0%	44.0%
Mobile phone	30.3%	25.1%	33.7%	65.4%	23.0%	30.5%	50.0%
Computer	26.5%	25.4%	26.2%	34.6%	24.9%	27.0%	31.0%

Computers are used by 26.5% of these minors. By gender, its use was balanced, amounting to 27.0% in the case of boys and 26.1% in the case of girls. By analyzing the level of maternal education, it was observed that, the more education, the less use of the computer by the minors. In the case of fathers, the trend was inverse. We can see how the rates of computer use increase as the professional category of the mother increases. In the case of the professional category of the father, the data present few differences.

Table 2. Comparison of media consumption of children analyzed according to their father's educational level and professional category							
Device	Total	Educational level of the mother			Professional category of the mother		
		High	Medium	Low	High	Medium	Low
Television	69.8%	66.9%	69.3%	71.8%	68.8%	67.9%	70.1%
Tablet	50.9%	47.0%	55.7%	51.3%	47.8%	52.7%	49.4%
Videogames	33.8%	30.3%	35.5%	38.5%	28.6%	34.5%	42.5%
Mobile phone	30.3%	21.1%	34.2%	59.0%	21.4%	31.4%	49.4%
Computer	26.5%	26.8%	29.0%	19.2%	27.2%	26.4%	27.6%

3.3. Bivariate analysis results

Although previous data suggested trends in device consumption by these children according to the variables studied from their parents, a comparison was made to establish the presence of statistically significant differences. The comparison showed significant differences in the cases of videogame consumption, mobile phone use and television consumption. A chi-square test of independence was conducted to examine the relationship between the mother's professional status and videogame

consumption. The relationship between these variables was significant, X2 (2, N=792)=6.7, p=.00343. The professional category of the mother influences the consumption of videogames by her descendants. The relationship of influence of the professional category of the father was also significant, X2 (2, N=792)=5.7, p=.00564 (with a significance level of 10%).

With regard to mobile phone consumption, statistically significant differences were found with the mothers' educational level variable X2 (2, N=792)=36.37, p<.01 and the fathers' educational level variable X2 (2, N=792)=44.29, p<.01. The relationship of influence of the professional category of the mother is significant X2 (2, N=792)=23.22, <.0001 as well as that of the father X2 (2, N=792)=23.59, p<.0001.

Finally, statistically significant differences were found between the mother's studies variable and television consumption among the children studied, X2 (2, N=792)=12.00, p=.0025.

4. Discussion and conclusions

The research data reveal the importance of considering the socio-educational level of parents when understanding the type of use and consumption of digital screens by children, especially in the case of videogames, mobile phones and television. More specifically, the two mediating variables are related to the educational and professional level of the mother. In other contexts, not related to digital screens, numerous studies (Martin et al., 1991; Oliva & Palacios, 1997) have confirmed that the higher the level of education and the higher the mother's professional qualification, the higher the expectations about the child's achievements and the importance given to their personal development and autonomy. Meanwhile, when the mother's educational level is low, greater importance is given to school performance, discipline and obedience. However, there is no previous work that analyzes the role of the mother's educational and professional level in the interaction of children with digital screens.

This confirms the greater weight that mothers continue to have in the tasks of parenting compared to fathers (Craig & Mullan, 2011). On the other hand, the differences obtained in the amount of digital screen consumption by children based on the educational and professional level of their mothers can be explained because a higher educational and professional level among mothers also increases the income level of the family as a whole, which gives access to a wider variety of extracurricular and recreational activities that families with fewer economic resources can hardly afford. Another possible explanation (which does not invalidate the previous one) is that mothers with a higher level of education are also more attentive to research on children's issues (Looze, 2014) including those that warn of the risks of failing to set limits on screen consumption. It is necessary to reflect on the results from this structural perspective in order to avoid making the mistake of blaming mothers with lower educational and professional levels.

Children from disadvantaged families receive less mediation from their parents, for a variety of reasons. Hence, initiatives promoting the digital inclusion of children should remain a priority (Garmendia et al., 2016; Katz et al., 2018). Considering the implications that the mothers' educational and professional variable has on the family upbringing system, as well as on the expectations for children's behavior, is an important piece of information when designing family guidelines for children's media literacy. This possible intervention should also consider the needs of the child in order to mediate as effectively as possible in the use of technology (De-Haan & Livingstone, 2009). Thus, the findings of this study represent a clear opportunity to design a family plan for healthy media use (Chassiakos et al., 2016). Such a plan should present an appropriate balance between screen time and other offline activities, set limits on access to content, guide the viewing of personal information, encourage critical thinking and age-appropriate digital literacy, and support family communication and the implementation of consistent rules on media use.

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References

AIMC (Ed.) (2018). Más del 40% de los niños ve contenidos televisivos en los dispositivos móviles o el ordenador. Asociación para la Investigación de los Medios de Comunicación. https://bit.ly/2U64s3x

AIMC (Ed.) (2019). Marco General de los Medios en España 2019. Asociación para la Investigación de los Medios de Comunicación. https://bit.ly/2U5d36q

Berríos-Valenzuela, L., Buxarrais-Estrada, M.R., & Garcés, M.S. (2015). ICT use and parental mediation perceived by chilean children. [Uso de las TIC y mediación parental percibida por niños de Chile]. *Comunicar*, *23*(45), 161-168. https://doi.org/10.3916/c45-2015-17

Bozzola, E., Spina, G., Ruggiero, M., Memo, L., Agostiniani, R., Bozzola, M., & Villani, A. (2018). Media devices in pre-school children: The recommendations of the Italian pediatric society. *Italian Journal of Pediatrics*, *44*(1), 69-69. https://doi.org/10.1186/s13052-018-0508-7

Buckingham, D. (2007). Digital media literacies: Rethinking media education in the age of the Internet. *Research in Comparative and International Education*, *2*(1), 43-55. https://doi.org/10.2304/rcie.2007.2.1.43

Cabrales, O., & Díaz, V. (2017). El aprendizaje autónomo en los nativos digitales. *Conhecimento & Diversidade*, *9*(17), 12-12. https://doi.org/10.18316/rcd.v9i17.3473

Chassiakos, Y.R., Radesky, J., Christakis, D., Moreno, M.A., Cross, C., Hill, D., & Swanson, W.S. (2016). Children and Adolescents and Digital Media. *Pediatrics*, *138*(5), e20162593. https://doi.org/10.1542/peds.2016-2593

Chaudron, S., Beutel, M.E., Donoso Navarrete, V., Dreier, M., Fletcher-Watson, B., Heikkilä, A.S., & Mascheroni, G. (2015). Young children (0-8) and digital technology. A qualitative exploratory study across seven countries. *European Commission Joint Research Centre*. https://bit.ly/3dgut7R

Correa, T. (2015). The power of youth: How the bottom-up technology transmission from children to parents is related to digital (in)equality. *International Journal of Communication*, *9*, 1163-1186. https://bit.ly/3dg1lNT

Craig, L., & Mullan, K. (2011). How mothers and fathers share childcare: A cross-national time-use comparison. *American Sociological Review*, *76*(6), 834-861. https://doi.org/10.1177/0003122411427673

Dashti, F.A., & Yateem, A.K. (2018). Use of mobile devices: A case study with children from Kuwait and the United States. *International Journal of Early Childhood*, *50*(1), 121-134. https://doi.org/10.1007/s13158-018-0208-x

De-Haan, J., & Livingstone, S. (2009). *Policy and research recommendations*. EU Kids Online y LSE. https://bit.ly/39dKXue El-Asam, A., Samara, M., & Terry, P. (2019). Problematic internet use and mental health among British children and adolescents. *Addictive Behaviors*, *90*, 428-436. https://doi.org/10.1016/j.addbeh.2018.09.007

Fajardo-Bullon, F., Valverde, B.B., Barco, B.L.D., & Felipe-Castaño, E. (2019). Salud mental de adolescentes españoles según variables contextuales y horas de uso de internet. *Universitas Psychologica*, *18*(2), 1-12. https://doi.org/10.11144/javeriana.upsy18-2.smae

Garmendia, M., Jiménez, E., Casado, M.A., & Mascheroni, G. (2010). Net children go mobile: Riesgos y oportunidades en internet y el uso de dispositivos móviles entre menores españoles. *Red.es/Universidad del País Vasco*. https://bit.ly/2U7E61d

Hargittai, E. (2010). Digital Na(t)ives? Variation in internet skills and uses among members of the 'net Generation. *Sociological Inquiry*, *80*(1), 92-113. https://doi.org/10.1111/j.1475-682X.2009.00317.x

Jiménez-Iglesias, E., Garmendia-Larrañaga, M., & Río, M.A.C.D. (2015). Children's perception of the parental mediation of the risks of the Internet. *Revista Latina de Comunicación Social*, *70*, 49-68. https://bit.ly/3ae4MCT

Katz, V.S., Moran, M.B., & Gonzalez, C. (2018). Connecting with technology in lower-income US families. *New Media & Society*, *20*(7), 2509-2533. https://doi.org/10.1177/1461444817726319

Kılıç, A.O., Sari, E., Yucel, H., Oğuz, M.M., Polat, E., ... Senel, S. (2019). Exposure to and use of mobile devices in children aged 1–60 months. *European Journal of Pediatrics*, *178*(2), 221-227. https://doi.org/10.1007/s00431-018-3284-x

Kuo, M.H., Magill-Evans, J., & Zwaigenbaum, L. (2015). Parental mediation of television viewing and videogaming of adolescents with autism spectrum disorder and their siblings. *Autism*, *19*(6), 724-735. https://doi.org/10.1177/1362361314552199 Lauricella, A.R., Wartella, E., & Rideout, V.J. (2015). Young children's screen time: The complex role of parent and child factors. *Journal of Applied Developmental Psychology*, *36*, 11-17. https://doi.org/10.1016/j.appdev.2014.12.001

Lissak, G. (2018). Adverse physiological and psychological effects of screen time on children and adolescents: Literature review and case study. *Environmental Research*, *164*, 149-157. https://doi.org/10.1016/j.envres.2018.01.015

Livingstone, S., & Haddon, L. (2009). *Kids Online. Opportunities and risks for children*. Policy Press. https://doi.org/10.2307/j.ctt9qgvds

Livingstone, S., Mascheroni, G., & Staksrud, E. (2018). European research on children's internet use: Assessing the past and anticipating the future. *New Media & Society*, *20*(3), 1103-1122. https://doi.org/10.1177/1461444816685930

Looze, J. (2014). Young women's job mobility: The influence of motherhood status and education. *Journal of Marriage and Family*, *76*(4), 693-709. https://doi.org/10.1111/jomf.12122

Määttä, S., Kaukonen, R., Vepsäläinen, H., Lehto, E., Ylönen, A., ... Roos, E. (2017). The mediating role of the home environment in relation to parental educational level and preschool children's screen time: a cross-sectional study. *BMC Public Health*, *17*(1), 1-11. https://doi.org/10.1186/s12889-017-4694-9

Martin, P., Halverson, C.F., Wampler, K.S., & Hollett-Wright, N. (1991). Intergenerational differences in parenting styles and goals. *International Journal of Behavioral Development*, *14*(2), 195-207. https://doi.org/10.1177/016502549101400205

Medrano, C., de Morentín, J.I.M., & Apodaca, P. (2015). Perfiles de consumo televisivo: Un estudio transcultural. *Educación XX1*, *18*(2), 305-321. https://doi.org/10.5944/educxx1.14606

Mullan, K. (2018). Technology and Children's screen-based activities in the UK: The story of the millennium so far. *Child Indicators Research*, *11*(6), 1781-1800. https://doi.org/10.1007/s12187-017-9509-0

Nikken, P., & Jansz, J. (2006). Parental mediation of children's videogame playing: A comparison of the reports by parents and children. *Learning, Media and Technology, 31*, 181-202. https://doi.org/10.1080/17439880600756803

Nikken, P., & Schols, M. (2007). How and why parents' guide the media use of young children. *Journal of Child and Family Studies, 24*(11), 3423-3435. https://doi.org/10.1007/s10826-015-0144-4

Novoa, B. (2017). Los niños y niñas en tiempos de Facebook: Especial referencia a los huérfanos digitales. *Persona y Familia, 1*(6), 113-121. https://doi.org/10.33539/peryfa.2017.n6.472

Observatorio Nacional de Telecomunicaciones y de la Sociedad de la Información (Ed.) (2019b). Indicadores sobre uso de TIC por menores en España. https://bit.ly/33Ef9xv

Observatorio Nacional de Telecomunicaciones y de la Sociedad de la Información (Ed.) (2019a). Las TIC en los hogares españoles. Estudio de demanda y uso de Servicios de Telecomunicaciones y Sociedad de la Información. https://bit.ly/39huZ21

Oliva, A., & Palacios, J. (1997). Diferencias entre las expectativas y valores de madres y educadores de niños preescolares españoles. *Infancia y Aprendizaje, 20*, 61-76. https://doi.org/10.1174/021037097761403253

Paudel, S., Jancey, J., Subedi, N., & Leavy, J. (2017). Correlates of mobile screen media use among children aged 0–8: A systematic review. *BMJ Open, 7*(10), e014585. https://doi.org/10.1136/bmjopen-2016-014585

Penelo, E., Espinoza, P., Portell, M., & Raich, R.M. (2012). Assessment of body image: Psychometric properties of the body image questionnaire. *Journal of Health Psychology, 17*(4), 556-566. https://doi.org/10.1177/1359105311417913

Ponce-De-León, R., Rivas, J., & Castillo, N. (2016). Participación de la familia en la sociedad virtual: Conocimiento sobre los usos y riesgos de Internet. *Suplemento Signos EAD, 1*(2). https://bit.ly/2Ww72RS

Sánchez, M., de Frutos-Torres, B., & Vázquez-Barrio, T. (2017). Parent's influence on acquiring critical internet skills. [La influencia de los padres en la adquisición de habilidades críticas en Internet]. *Comunicar*. https://doi.org/10.3916/C53-2017-10

Valcke, M., Bonte, S., Wever, B.D., & Rots, I. (2010). Internet parenting styles and the impact on Internet use of primary school children. *Computers & Education, 55*(2), 454-464. https://doi.org/10.1016/j.compedu.2010.02.009

Velarde, O. (1992). Los arquetipos de los MCM: Héroes y antihéroes de los niños. *Revista Española de Investigaciones Sociológicas, 57*(57), 167-167. https://doi.org/10.2307/40183604

Warren, R. (2001). In words and deeds: Parental involvement and mediation of children's television viewing. *The Journal of Family Communication, 1*(4), 211-231. https://doi.org/10.2307/40183604

Maladaptive use of ICT in adolescence: Profiles, supervision and technological stress

Uso desadaptativo de las TIC en adolescentes: Perfiles, supervisión y estrés tecnológico

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ABSTRACT

ICT use during adolescence is now commonplace. Its power of attraction and the vulnerable condition of adolescents are giving rise to growing concern, aggravated by the imminent consequences of such synergy. In order to deepen understanding of this relationship, the following research objectives were formulated: a) Analyze the frequency of ICT use; b) Examine family supervision; c) Identify stress associated with the use of ICTs; d) Establish profiles of ICT use. The sample consisted of 1,101 adolescents of 10 educational centers in Southeastern Spain. A descriptive analysis was performed and contingency tables, Chi Square, Cramer V, hierarchical cluster analysis and one-factor ANOVA were used. The results show that more than 60% of adolescents use ICTs without supervision and that 1 out of 3 feel stressed in the absence of the Internet. In addition, statistically significant relationships were found between the frequency of ICT use and stress, as well as with family supervision. A solution of three groups or profiles of use was obtained. 45% of the subjects display maladaptive use or signs of it. The study concludes by stressing that the relationship between adolescents and ICTs is far from ideal and warns of the urgent need to train adolescents and parents in the responsible use of ICTs.

RESUMEN

El uso de las TIC durante la adolescencia es un hecho normalizado en la actualidad. Su poder de atracción y la condición de vulnerabilidad de los púberes están suscitando una creciente preocupación, agravada por las consecuencias inminentes de tal sinergia. Con la finalidad de profundizar en esta relación, se formulan los siguientes objetivos de investigación: a) Analizar la frecuencia de uso de las TIC; b) Examinar la supervisión familiar; c) Identificar estrés asociado al uso de las TIC; d) Establecer perfiles de uso de las TIC. La muestra estuvo compuesta por 1.101 adolescentes de 10 centros educativos del Sureste Español. Se realizó un análisis descriptivo y se emplearon tablas de contingencia, Chi Cuadrado, V de Cramer, análisis de clúster jerárquico y ANOVA de un factor. Los resultados arrojan que más del 60% de los adolescentes usa las TIC sin supervisión y que uno de cada tres se siente estresado ante la ausencia de Internet. Además, se encontraron relaciones estadísticamente significativas entre la frecuencia de uso de las TIC y el estrés, así como con la supervisión familiar. Se obtuvo una solución de tres grupos o perfiles de uso. El 45% de los sujetos tiene un uso desadaptado o indicios del mismo. Se concluye subrayando que la relación entre adolescentes y TIC dista mucho de la deseada y se alerta de la imperiosa necesidad de formar a adolescentes y a progenitores en el uso responsable de las TIC.

KEYWORDS | PALABRAS CLAVE

ICT abuse, adolescence, family control, technological stress, video games, mobile, behavioral problems, secondary school.
Abuso de las TIC, adolescencia, control familiar, estrés tecnológico, videojuegos, móvil, problemas de conducta, educación secundaria.

1. Introduction and state of the art

As with every big change, the sudden appearance of ICTs in everyday life has prompted a variety of opinions. Some praise their benefits and potential advantages (Agudo et al., 2013), while some others highlight the risks and threats implicit in their use (Giménez et al., 2014; Golpe et al., 2017).

The so-called "Generation Z", also known as the post-Millennial generation, is the first generation born within a completely technological society. From the day they were born, these teenagers have naturally lived alongside ICTs, incorporating their use as just another element in learning and socialization processes (Urosa, 2015, Maquilón-Sánchez et al., 2017). As a consequence, a gap has appeared between parents and their children, referred to as the "digital divide" (Alfaro et al., 2015). In this regard, the appropriate frequency of use is still unknown, and a set of best practices with suggestions and guidance to have as support and reference regarding how to use ICTs optimally is also lacking.

Various researchers emphasise the key role of families in teaching and preventing inappropriate uses of ICTs (Bartau-Rojas et al., 2018, Villanueva-Blasco & Serrano-Bernal, 2019). In the meantime, parents show a growing concern about how frequently their children use ICTs, who also experience anxiety if they cannot use them (Labrador & Villadangos, 2009). Exposure to screens, access to inappropriate content, and contact with strangers online are also worrisome (Alfaro et al., 2015). Regarding these, recent studies reveal that more than 95% of parents affirm they need training in the use of ICTs and on-line safety (Gairín-Sallán & Mercader, 2018). This approach has allowed for the conceptualization of maladaptive uses of ICTs as actions such as abandoning personal, family, educational and social obligations to spend time online and playing videogames; reducing academic performance; preferring to socialize in a virtual world instead of the real world; feeling anxious when they do not get messages or calls; suffering from sleep alterations to continue using their phones; feeling aggressive or irritable when they are interrupted while using devices, etc. Along these lines, Bartau-Rojas et al. (2018) identified some mediation strategies: the establishment of rules, organisation time-space limits, supervision and support. However, even though ICTs could inherently be used to supervise and control (Santana-Vega et al., 2019), in the last study conducted by Gairín-Sallán et al. (2018) it was found that 63.5% of minors between 15 and 17, and 71.8% of minors between 12 and 14, have no supervision regarding the time spent, neither content, nor resources accessed when using ICTs.

Nevertheless, it is clear that ICTs have become essential resources for youth. According to the data gathered by the INE in 2017, 98.1% of boys and 97.7% of girls between 16 and 24 years old use their mobile phone, play videogames and use the internet regularly. It would be ideal if a more educated, critical and reflective society would emerge from the advantages offered by ICTs. As it is claimed by Benítez (2019), a rational use of ICTs in some subjects has a positive correlation with an improvement in academic performance. However, not everyone is ready to exploit the possibilities offered by ICTs in a beneficial manner. Adolescence is a uniquely vulnerable stage in which ICTs are used without any previous training (Bartau-Rojas et al., 2018). It has been found that certain psychological, physical, school, personal and family disorders are associated to maladaptive use of ICTs: nomophobia (Bragazzi & Del-Puente, 2014), FoMO (fear of missing out) (Oberst et al., 2017; Syahniar et al., 2018), feelings of anxiety (Rodríguez et al., 2012), digital obesity (Díaz & Aladro, 2016), behavioral alterations, impoverishment of social relationships (García et al., 2014), a decline in academic performance (Vilca y Vallejos, 2015), and other pathologies related to psychology such as depression, anxiety, nervousness (Oberst et al., 2017; Santana-Vega et al., 2019), insomnia (Jaradat, 2019) and technological stress (Villanueva-Blasco & Serrano-Bernal, 2019).

It is clear to us that an extensive use of ICTs among the youngest produces non-desirable effects in the educational, personal, social and family contexts (Díaz-Vicario et al., 2019), effects that are enlarged when it comes to teenagers, who use ICTs more often and more frequently, in a situation of social vulnerability (Melendro et al., 2016). A deeper study on the use of ICTs among young people is needed, paying special attention to family supervision as well as to the indicators of pathologies of psychological nature coming from the maladaptive use among teenagers. To do so, an investigation with the following aims was conducted: 1) Analyze frequency of use of ICTs among teenagers; 2) Examine family supervision, timetable or limitations to access ICTs; 3) Describe states of anxiety, stress and nervousness associated with the use of ICTs; 4) Identify group profiles of ICT use.

2. Materials and methods

2.1. Participants

The sample was comprised of a total of 1,101 participants, from which 47.8% were boys and 52.2% girls in the 1st year of Compulsory Secondary Education (ESO for its initials in Spanish) (32.4%), 2nd year of ESO (22.3%), 3rd year of ESO (24.3%), and 4th year of ESO (21%), with age ranges between 11 and 18 (17% between 11 and 12; 46.1% between 13 and 14, and 36.2% between 15 and 18). This sample, with a 95% confidence interval and a 5% margin of error, was obtained by probability sampling selecting 10 public centres among the 9 regions that make up the Region of Murcia. Because of the nature of this study, the establishment of exclusion criteria was not required.

2.2. Design

The study follows a nonexperimental quantitative research design. A transactional survey design was used; therefore, the timing of the study was set on a specific moment (Sáez-López, 2017).

2.3. Instruments

The questionnaire Ud-TIC maladaptive use of ICTs (α=.841), administered ad hoc from previously validated instruments for the teenage population in Spanish territory, was used; the scales CERI, CERM (Beranuy et al., 2009), CERV (Chamarro et al., 2014) and CHASO were also used (Caballo & Salazar, 2017). It consists of two dimensions: 1) Dimension 1, sociodemographic data: asks for personal data (age, gender, study year, and region), academic performance (marks in instrumental areas and 3 questions about attitudes towards studying and the interference of ICTs), family supervision (existent control, adults in charge of supervising, and timetable and availability of access to ICTs) and manifestation of stress and nervousness when ICTs are not present. 2) Dimension 2, Frequency of Use of ICTs is made up of 19 items, 3 related to frequency of use (mobile phone, the Internet and videogames) and 16 to experiences related to the use of mobile phones, the Internet and videogames.

2.4. Procedure

Complying with rule 8.2 of APA, a document requesting signed consent was distributed and the authorization of each parent of the participants was also solicited. Students were given a document of informed consent about the anonymity and voluntary nature of their participation. Both documents were previously validated by the Research Ethical Commission of the University of Murcia. The instruments were applied in paper form. Data collection took place during office hours and in the presence of the school tutor. Completing the questionnaire took approximately between 12 and 20 minutes.

3. Analysis and results

To begin, a descriptive analysis of the sample was conducted, calculating the central tendency averages (median and standard deviation). Next, the normality test Kolmogorov-Smirnov (K-S) was run, concluding that the sample did not follow normal or symmetric distribution (p≤.05). However, considering that one of the limitations of this test is its conservative tendency by which in every situation (for n=1000 subjects) the non-normality hypothesis is accepted, the Lilliefors (K-S-L) test correction was applied, which allows for a certain percentage to reject the null hypothesis. However, in this case, the existence of an asymmetric distribution was reiterated, therefore the nonparametric tests Mann–Whitney U (for two groups) and Kruskal Wallis (for more than two groups) were applied. Contingency tables were used to establish correlations between variables and Pearson's Chi-squared test was used to determine the existence of significant relations. Cramer's V was conducted to assess the strength of statistically significant associations. Additionally, to examine the existence of different profiles in the data obtained, a hierarchical clustering analysis using Ward's method was also conducted. The appropriateness of this test was verified by running a one-way ANOVA.

3.1. First objective: the frequency of ICT use

Data analysis showed that 6.3% of students use a gaming console daily, followed by a 16% using it a few times weekly, a 17.4% only during the weekend, 25% rarely and 35% never, (M=2.32). Regarding gender,

boys use gaming consoles more, one out of ten use it daily and 26% use it a few times weekly, whereas only 1% of the girls use the gaming console daily and 6.4% a few times weekly (p>.01). Concerning study year, 1st year ESO students are the ones using videogames more often, 7% affirm playing every day and 19% a few times weekly, followed by 2nd year ESO students, with 7% playing every day and 17% a few times weekly, in 3rd year ESO almost 5% of students play every day and 15% a few times weekly. 4th year ESO students use the gaming console less often, 6.5% daily and 10.8% a few times a week (p=.005). Re: the use of mobile phones (Table 1), 1 out of 3 participants report using their mobile phones constantly, whereas 33.5% use it a lot, 25% frequently and 11% only when needed, and 2.9% never (M=3.72). Significant statistical differences were found for the variables gender (p=.003) and study year (p<.01).

Table 1. Frequency of use of the mobile phone according to study year			Never	When I need	Frequently	A lot	Constantly
1st ESO	Frq	357	16	53	97	108	83
	%	100	4.5	14.8	27.2	30.3	23.2
2nd ESO	Frq	245	7	33	59	75	71
	%	100	2.9	13.5	24.1	30.6	29.0
3rd ESO	Frq	268	5	22	71	90	80
	%	100	1.9	8-2	26.5	33.6	29.9
4th ESO	Frq	231	3	13	48	96	71
	%	100	1.3	5.6	20.8	41.6	30.7

In regards to gender, girls use their mobile phones more, with one out of three using the phone constantly and 32.5% a lot. Moreover, 23.4% of the boys use it constantly, and 34.6% a lot. Concerning study year, a progressive increase in the use of mobile phones as they go onto the next study year is observed (Table 1). In reference to other gadgets with Internet connection, teenagers use these less often than mobile phones, although it is still high. Nevertheless, 13% of participants use other gadgets with Internet connection constantly, followed by 25.7% who use these a lot, 25.9% frequently, and 30.3% only when needed (M=3.13). Regarding gender, a similar tendency among boys (13.7% constantly and 27% a lot) and girls (13% constantly and 24.5% a lot) is perceived. In this way, there are no significant statistical differences (p=.447). Concerning study year, there is a stable tendency in the use of gadgets with Internet connection (p=.600); thus, in 1st year ESO 13.2% of students use them constantly, with 23.2% using them a lot; in 2nd year ESO 13.9% use it constantly and 25.7% use it a lot; in 3rd year ESO 13.8% use it constantly and 27.6% a lot; in 4th year ESO only 12.6% use it constantly and 27.3% a lot.

3.2. Second objective: the role that family supervision plays in the use of ICTs

Three types of supervision were established: 1) supervising the use of the Internet and social networks; 2) supervising time spent playing with a gaming console; 3) supervising the type of videogames played. Regarding family supervision on the use of the Internet and social networks by teenagers, 56% of the students reported not having any type of family supervision while surfing the net; similarly, 4 out of 10 have no supervision of the time spent playing videogames, and 60% of parents do not supervise the type of videogames their children play.

Regarding gender, parents supervise girls more when using the Internet and social networks (45.4%). Boys are more supervised on the time they spend playing videogames (64.6%), whereas for girls it is only a 48.9%. This percental difference is statistically significant when both groups are compared (p<.01).

With regards to study year, there is a progressive decrease in the supervision of the use of the Internet and social networks (62% 1st year ESO, 43% 2nd year ESO, 30% 3rd year ESO and only 26% for students in 4th year ESO) (p<.01). Concerning the time, they spend playing videogames, there is a similar tendency towards a decrease in supervision as students move onto the next study year; 69% of students in 1st year ESO have supervision, 57.6% of 2nd year students, 56% of 3rd year students and only 36% of 4th year ESO students (p<.01). Finally, supervising the type of games, there is a progressive decrease as students move onto the next study year; 62% of students in 1st year have family supervision, 43.7% in 2nd year, 32.8% in 3rd year and only 26.4% in 4th year ESO (p<.01). When students are asked about the parent in charge of the supervision, in most cases both are involved (31.8%), followed by only mothers (15.5%), only

fathers (4.2%), grandparents (0.4%) and others (2.6%). Another measure of family supervision is related to the limiting of time spent online. In terms of the timetable of access to the Internet (Figure 1), 60% of teenagers have access to the Internet throughout the day, followed by 26% with access only in the evening, 10% only at night, and 2.5% never. Regarding gender, boys have more access to the Internet throughout the day (62.5%) than girls (59.3%), although these differences are not statistically significant (p=.262). Concerning age, older students (between 15 and 17) have more access to the Internet (80% constantly), and more than half of students between 13 and 14 have freedom to access the Internet whenever they want; in younger ages (11 to 12), 1 out of 4 have constant access to the Internet (p<.01).

Figure 1. Timetable to access the Internet
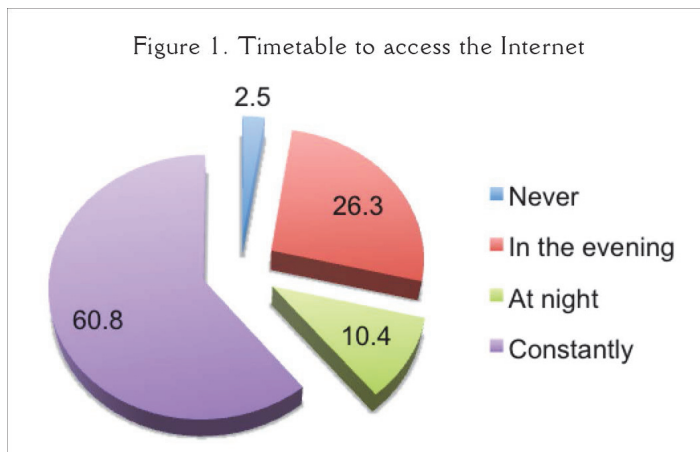
Within this same objective, frequency of use of ICTs and family supervision was analysed. Data suggests a statistically significant correlation between the frequency of use of gaming consoles and a lack of family supervision when using the Internet and social networks ($\chi^2 8=24.824$, p≤.05, V=.22); it is worth mentioning that 80% of students using a console every day have no family supervision while playing online (Figure 2).

Figure 2. Relationship between supervision and frequency of use

	Never	Only when I need to	Frequently	A lot	Constantly
Yes	4.2	14.8	31.2	29.2	20.6
No	1.2	8.6	20.2	36.8	33.2
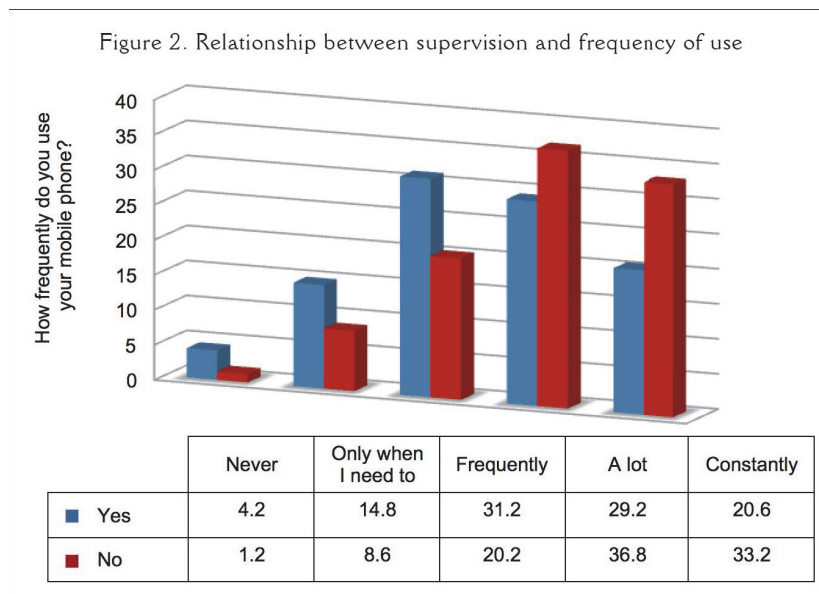
There is also a lack of family control in 60% of the participants using the gaming console a few times a week and in 45% of those playing videogames during the weekend. Additionally, 45% of teenagers playing videogames every day and 36% of those playing a few times a week do it without any time limitation from their parents ($\chi^2 8=69.581$, p<.01, V=.21). In this line, seven out of ten youngsters use their mobile phones or gadgets with constant Internet access without any family supervision ($\chi^2 8=52.123$, p<.01, V=.21).

3.3. Third objective: the relationship between access to ICTs and feelings of anxiety and nervousness of adolescents

It was found that 33% of the students feel stressed or nervous when they have no access to the Internet. Girls affirm feeling more nervous when they are forbidden access to the Internet (35%) than boys (27%). Regarding study year, the presence of stress is stable, although it diminishes partially in students in the 4th year of ESO. Concerning frequency of use of ICTs, 52% of students using their phone constantly confess feeling stressed or nervous when they cannot connect to the Internet. The percentage of stressed students decreases when the frequency of use is less (29.5% of students using it a lot, 17.8% using it frequently, and 14% using it only when needed ($\chi^2(2)=100.87$, p<.01, V=.30)). Those students playing videogames every day feel more stressed when they do not have access to the Internet (44.9%), followed by those who play a few times a week (29.4%), rarely (29.5%), and only the ones playing with the gaming console during the weekend are less stressed than the other groups ($\chi^2(4)=19.65$, p=.001, V=.134). This tendency happens again when frequency of use of other gadgets with Internet connection and feelings of stress are correlated ($\chi^2(4)=25.029$, p<.01, V=.151), with a slow increase between frequency of exposure to screens and stress when there is no connection; 44.2% of students using them constantly feel stressed, followed by 37% using them a lot and 26% frequently.

Table 2. Final centre of conglomerates among groups according to the profile of ICT use					
Item	Cluster 1 Maladaptive use (n=118)	Cluster 2 Signs of maladaptive use (n=335)	Cluster3 Maladaptive use (n=648)	Total	F
1. Abandoning responsibilities to use the Internet	3.18	3.96	4.35	3.99	.752
2. Decrease of academic performance because of the use of the Internet	2.26	3.79	4.30	3.74	5.35***
3. Avoiding problems on the Internet	2.87	2.89	4.45	3.59	2.85**
4. Easier to socialise online	2.98	3.57	4.27	3.78	2.164*
5. Risk of losing academic or personal opportunities	4.04	3.57	4.27	3.78	3.32***
6. Decrease of academic performance because of mobile use	2.57	3.88	4.43	3.90	6.07***
7. Nervousness when not receiving messages or calls	3.89	4.41	4.72	3.86	.719
8. Staying up late to use mobile phone or gaming console	2.90	3.76	4.32	3.86	3.73***
9. Need to spend more time on the phone	3.57	4.32	4.75	4.38	2.068*
10. Anger or irritability when someone disturbs you while using the mobile phone	3.07	4.04	4.46	4.06	2.66**
11. Saying things on the phone you wouldn't say in person	3.47	4.01	4.43	4.10	1.466
12. Abandoning tasks to play videogames	3.16	3.52	4.72	4.00	.996
13. Decrease in academic performance because of videogames	2.55	4.41	4.44	4.09	2.93**
14. Anger or irritability when someone disturbs you while using the gaming console	3.11	4.22	4.55	4.17	3.11**
15. Need to spend more time to feel satisfied	3.45	4.58	4.86	4.50	2.90**

Teenagers who have family supervision when using the Internet and social networks show less stress when access to the Internet is absent or impossible (27.71%) compared to teenagers who have no supervision from their parents or other adults (34.03%) ($\chi^2 2=7.222$, p=.027, V=.027). In the case of students without family supervision of time spent playing with the gaming console, they show more stress when these cannot be accessed (35.7%) compared to teenagers with supervision from their parents (28%) ($\chi^2 2=7.870$, p=.02, V=.02). A statistically significant association between the limitation of time

spent accessing the Internet and the presence of states of stress ($\chi^2 2=727.658$, p<.01, V=.158) was also found; students feeling more stressed were those who have access to the Internet only at night (42.1%), followed by those who have no access (33.3%) and by those who have access throughout the day (31.3%). The participants that reported having the least stress when there was no access to the Internet were those who had access only during the evening (19.7%).

3.4. Fourth objective: identification of ICT usage profiles

To achieve this, a multivariate hierarchical cluster was used. An appropriate classification for three groups represented in the dendrogram was found (Figure 3). The hierarchical result of three groups was replicated with an ANOVA. The accumulated average distance between 1 and 2 was 4.059, whereas the average distance between 2 and 3 was 3.158. Average scores for grouping variables are included in Table 2.

Cluster 3 was coded "Adapted use of ICTs" (n=648) and included students showing an appropriate use of ICTs. Cluster 2, coded "Signs of maladaptive use of ICTs" (n=335) was characterized by showing average levels of experiences related to a maladaptive use of ICTs.

And Cluster 1 was coded "maladaptive use of ICTs" (n=118), which corresponds to 10.72% of students, characterized by showing a homogeneous profile of subjects that manifest a higher level of experiences related to the maladaptive use of ICTs, such as abandoning responsibilities to spend more time on the Internet and playing videogames, a decrease in academic performance because of the use of the Internet, the mobile phone or videogames, avoiding problems with the use of the Internet, showing more ability to socialize online than in person, nervousness when not receiving messages or calls, staying up late to spend time on their phones or the gaming console, feeling the need to spend more time on their phone or gaming console, frustration or anger when someone interrupts them while using their phones or gaming console, or saying things via their phone that they would not say in person.

Figure 3. Student dendrogram after hierarchical cluster analysis
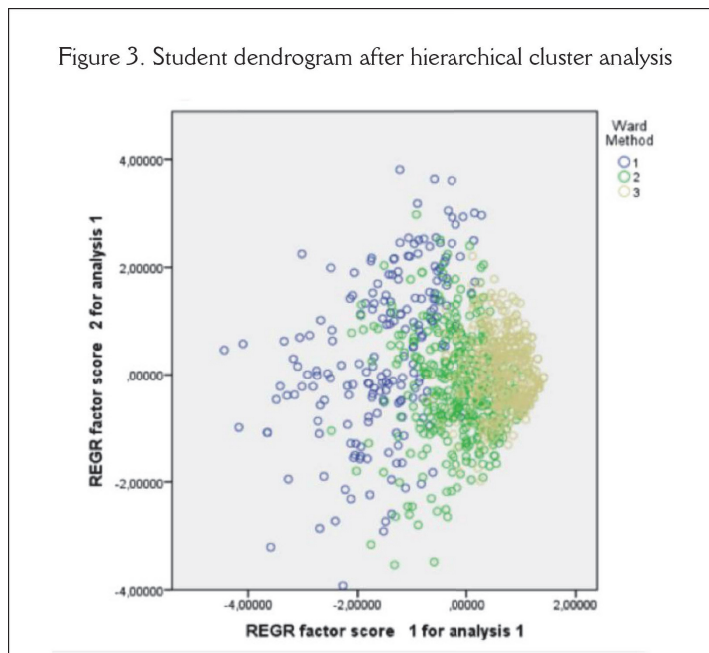
4. Discussion and conclusions

The use of ICTs in teenagers is a generalized and normalized behaviour in society today. However, the great power of attraction that ICTs have and the condition of vulnerability during adolescence are two variables that, combined, require supervision from adults so that a healthy relationship between ICTs and teenagers can be created. In this regard, results indicate that two thirds of the participants show a

high or very high frequency of use of their mobile phones, and that a third part reports a high or very high frequency of use of other gadgets with Internet connection. The frequency of use of ICTs is notably greater than the rates found in studies by Villanueva-Blasco et al. (2019), who state that a third of students show a high frequency of Internet use.

Regarding gender, and in accordance with the findings of Giménez et al. (2017), girls use their mobile phones daily more often, but boys play more with gaming consoles. Similarly, coinciding with Conde (2018) and Santana-Vega et al. (2019), the frequency of use of the mobile phone increases with age, whereas the frequency of use of the gaming console seems to decrease as students move onto the next academic year. Considering gadget preference, in accordance with Díaz-Vicario et al. (2019), the mobile phone is the gadget most used among the young, followed by other devices with connection to the Internet and gaming consoles. It has been confirmed that more than half of teenagers use the Internet and social networks without supervision, and that two out of five play videogames without any type of supervision. The results obtained about family supervision and its relation with the age do not coincide with those published by Gairín-Sallán et al. (2018), who found a smaller rate of family supervision in early adolescents (12 to 14) In this respect, it seems that there is more control and supervision during the first years of ESO and a progressive decrease as students grow older. Frequency of use increases in the final years of ESO.

When the influence of gender was identified, results match those by Villanueva-Blasco et al. (2019), with girls dedicating more time to social networks and the Internet, and being more controlled and supervised by adults in their use; however, adults supervise boys more when it comes to time spent playing on gaming consoles. Adults in charge of supervision are mainly mothers or fathers, which coincides with results by Giménez et al. (2017). Considering these outcomes, it can be stated that family supervision is insufficient for this real problem, both regarding the use of the internet and social networks, and the type of videogames and the time spent playing games. Nevertheless, more than half of the teenagers surf the Internet without control, moderation or supervision. We coincide with Duerager & Livingstone (2012) in insisting on the fact that family control directly regulates exposure to online threats and is essential to face a problematic and maladaptive use of ICTs.

The present study concludes that more than a third of the teenagers participating feel stressed when they cannot use the Internet, results which match those found by Fondevila et al. (2014), who detected similar degrees of technological stress. A higher presence of stress is observed in participants with a higher use of ICTs, which establishes a direct correlation between stress and frequency of use of ICTs. In this respect, and according to what was claimed by Villanueva-Blasco et al. (2019), those teenagers who are more supervised by the adults responsible felt less stressed when they were not able to connect to the Internet. On the other hand, the limitation in the use of ICTs imposed by parents is more prevalent in the first years of ESO and decreases as students grow older, results that support conclusions by Alfaro et al. (2015), who found statistically significant differences between the variable "study year" and limitation of use. These authors found that limitations of use are greater in lower study years. Concerning the timetable to access the Internet, it is confirmed that limitations are insufficient to reduce stress levels. Proof can be found in the fact that participants having access only at night and those having access throughout the day are the most stressed; nevertheless, when frequency of use of the ICTs is lower, the number of stressed students is reduced.

With the obtained results it can be concluded that girls have a more problematic use of mobile phones, whereas boys have higher incidence of problems when using gaming consoles. The frequency of use of mobile phones increases progressively with the study year, something that does not occur with gaming consoles. It has been possible to identify three profiles of use of ICTs, and it is worth mentioning that half of the students have a maladaptive use of ICTs or show a dangerous number of signs of a maladaptive use, a particularly alarming finding because of the problems it entails.

It has been proven that the relation between teenagers and ICTs is far from desirable, and this study reveals a worrisome situation in which a high number of teenagers use technologies at all times, without any training or control from adults. Additionally, it is necessary to highlight that those adolescents who use ICTs more frequently are also those who show higher levels of stress because of continuous use or lack of access. The creation of preventive strategies and interventions to promote adequate use of the

Internet and to train teenagers in responsible and safe ICT use is urgently needed. Additionally, and in accordance with Bartau-Rojas et al. (2018), the main figures involved in these challenges should not be forgotten, namely families. Data in this area indicates that there is a need to intervene so that young people, as well as adults, are aware of the dangers of extended use of ICTs, and of the acceptance of threats such as contacting strangers or accessing inappropriate content, plus the already known negative impact on educational, personal, and social elements of one's life. Concerning limitations, there is the need to extend the sample of participants to other regions, include private educational centres, and search for and identify the most extreme cases to do qualitative analysis that allow for the identification, first hand, of the reasons and the negative effects that maladaptive use of ICTs has produced.

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References

Agudo, S., Fombona, J., & Pascual, M.A. (2013). Ventajas de la incorporación de las TIC en el envejecimiento. *Relatec*, *12*(2), 131-142. http://bit.ly/2TMltPZ

Alfaro, M., Vázquez, M.E., Fierro, A., Herrero, B., Muñoz, M.F., & Rodríguez, L. (2015). Uso y riesgos de las tecnologías de la información y comunicación en adolescentes de 13-18 años. *Acta Pediátrica Española*, *73*(6), 126-135. http://bit.ly/33gVjbo

Bartau-Rojas, I., Aierbe-Barandiaran, A., & Oregui-González, E. (2018). Parental mediation of the Internet use of Primary students: beliefs, strategies and difficulties. [Mediación parental del uso de Internet en el alumnado de Primaria: Creencias, estrategias y dificultades]. *Comunicar*, *54*, 71-79. https://doi.org/10.3916/c54-2018-07

Benítez, L.M. (2019). *Efectos sobre el rendimiento académico en estudiantes de secundaria según el uso de las TIC*. [Doctoral Dissertation, UNED]. Dialnet. http://bit.ly/3cWhrvU

Beranuy, M., Chamarro, A., Graner, C., & Carbonell, X. (2009). Validación de dos escalas breves para evaluar la adicción a Internet y el abuso de móvil. *Psicothema*, *21*(3), 480-485. http://bit.ly/2Qcj2UO

Bragazzi, N., & Puente, G.D. (2014). A proposal for including nomophobia in the new DSM-V. *Psychology Research and Behavior Management*, *7*, 155-155. https://doi.org/10.2147/prbm.s41386

Caballo, V.E., & Salazar, I.C. (2017). Desarrollo y validación de un nuevo instrumento para la evaluación de las habilidades sociales: El cuestionario de habilidades sociales (CHASO). *Psicología Conductual*, *25*(1), 5-24. http://bit.ly/33eF2DO Chamarro, A., Sánchez-Carbonell, X., Manresa, J.M., Muñoz-Miralles, R., Ortega-Gonzalez, R., López-Morrón, M.R., & Toran-Monserrat, P. (2014). El Cuestionario de Experiencias Relacionadas con los Videojuegos (CERV): Un instrumento para detectar el uso problemático de videojuegos en adolescentes españoles. *Adicciones*, *26*(4), 303-303. https://doi.org/10.20882/adicciones.31

Conde, E. (2018). El uso de la tecnología de la información y la comunicación entre adolescentes. *International Journal of Developmental and Educational Psychology*, *2*(1), 13-22. https://doi.org/10.17060/ijodaep.2018.n1.v2.1155

Díaz, R., & Aladro, M. (2016). Relación entre uso de las nuevas tecnologías y sobrepeso infantil, como problema de salud pública. *RqR Enfermería Comunitaria*, *4*(1), 46-51. http://bit.ly/2QeMREl

Díaz-Vicario, A., Juan, C.M., & Sallán, J.G. (2019). Uso problemático de las TIC en adolescentes. *Revista Electrónica de Investigación Educativa*, *21*(1), 1-11. https://doi.org/10.24320/redie.2019.21.e07.1882

Duerager, A., & Livingstone, S. (2012). *How can parent support children's internet safety?* EU Kids online. http://bit.ly/39MLgxe

Fondevila, J.F., Carreras, M., Mir, P., Del-Olmo, J.L., & Pesqueira, M.J. (2014). El impacto de la mensajería instantánea en los estudiantes en forma de estrés y ansiedad para el aprendizaje: Análisis empírico. *Didáctica, Innovación y Multimedia*, *30*, 1-15. http://bit.ly/33g9e1f

Gairín-Sallán, J., & Mercader, C. (2017). Usos y abusos de las TIC en los adolescentes. *Revista de Investigación Educativa*, *36*(1), 125-125. https://doi.org/10.6018/rie.36.1.284001

García, B., López, M.C., & García, A. (2014). Los riesgos de los adolescentes en Internet: Los menores como actores y víctimas de los peligros de Internet. *Revista Latina de Comunicación Social*, *69*, 462-485. https://doi.org/10.4185/RLCS-2014-1020

Giménez, A.M., Luengo, J.A., & Bartrina, M.J. (2017). ¿Qué hacen los menores en internet? Usos de las TIC, estrategias de supervisión parental y exposición a riesgos. *Electronic Journal of Research in Education Psychology*, *15*(43), 533-552. https://doi.org/10.25115/ejrep.43.16123

Giménez, A.M., Maquilón, J.J., & Arnaiz, P. (2014). Acceso a las tecnologías, rendimiento académico y cyberbullying en escolares de secundaria. *Revista Iberoamericana de Psicología y Salud*, *5*(2), 119-133. http://bit.ly/2wT9yHn

Golpe, S., Isorna, M., Gómez, P., & Rial, A. (2017). Uso problemático de Internet y adolescentes: El deporte sí importa. *Retos*, *31*, 52-57. http://bit.ly/3aTfnTU

Jaradat, M., Jibreel, M., & Skaik, H. (2020). Individuals' perceptions of technology and its relationship with ambition, unemployment, loneliness and insomnia in the Gulf. *Technology in Society*, *60*, 101199. https://doi.org/10.1016/j.techsoc.2019.101199

Labrador, F.J., & Villadangos, S.M. (2009). Adicción a nuevas tecnologías en adolescentes y jóvenes. In Echeburúa, E., Labrador, F.J., & Becoña, E. (Eds.), *Adicción a las nuevas tecnologías en jóvenes y adolescentes* (pp. 45-71). Pirámide.

Maquilón-Sánchez, J., Mirete-Ruiz, A., & Avilés-Olmos, M. (2017). La Realidad Aumentada (RA). Recursos y propuestas para la innovación educativa. *Revista Electrónica Interuniversitaria de Formación del Profesorado*, *20*(2), 183-183. https://doi.org/10.6018/reifop/20.2.290971

Melendro, M., García, F.J., & Goig, R. (2016). El uso de las TIC en el ocio y la formación de los jóvenes vulnerables. *Revista Española de Pedagogía*, *74*(263), 71-89. http://bit.ly/2ILZuTg

Oberst, U., Wegmann, E., Stodt, B., Brand, M., & Chamarro, A. (2017). Negative consequences from heavy social networking in adolescents: The mediating role of fear of missing out. *Journal of Adolescence*, *55*, 51-60. https://doi.org/10.1016/j.adolescence.2016.12.008

Rodríguez, R.A., Martínez, I.C., García, M.J., Guillén, V., Valero, M., & Díaz, S. (2012). Adicción a las nuevas tecnologías de la información y la comunicación (NTICS) y ansiedad en adolescentes. *Revista INFAD*, *1*(1), 347-356. https://bit.ly/3agr0Ey

Sáez-López, J.M. (2017). *Investigación educativa. Fundamentos teóricos, procesos y elementos*. UNED.

Santana-Vega, L.E., Gómez-Muñóz, A.M., & Feliciano-García, L. (2019). Adolescents problematic mobile phone use, Fear of Missing Out and family communication. [Uso problemático del móvil, fobia a sentirse excluido y comunicación familiar de los adolescentes]. *Comunicar*, *59*, 39-47. https://doi.org/10.3916/C59-2019-04

Syahniar, S., Maysitoh, M., Ifdil, I., Ardi, Z., Yendi, F.M., Rangka, I.B., Suranata, K., & Churnia, E. (2018). Social media fear of missing out: Psychometrics evaluation based on Indonesian evidence. *Journal of Physics: Conference Series*, *1114*, 012095-012095. https://doi.org/10.1088/1742-6596/1114/1/012095

Urosa, R. (2015). Jóvenes y generación 2020. *Revista de Estudios de Juventud*, *108*, 5-219. http://bit.ly/2II0uHU

Vilca, L.W., & Vallejos, M. (2015). Construction of the risk of addiction to social networks scale. *Computers in Human Behavior*, *48*, 190-198. https://doi.org/10.1016/j.chb.2015.01.049

Villanueva-Blasco, V., Serrano-Bernal, S., & and (2019). Patrón de uso de internet y control parental de redes sociales comopredictor de sexting en adolescentes: Una perspectiva de género. *Revista de Psicología y Educación*, *14*(1), 16-16. https://doi.org/10.23923/rpye2019.01.168

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School performance: New multimedia resources versus traditional notes

El rendimiento escolar: Nuevos recursos multimedia frente a los apuntes tradicionales

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ABSTRACT

With the increasing adoption of information and communication technologies among youngsters, it has become common for high school students to incorporate the use of multiple devices and digital platforms in their study habits. Although these digital resources support and motivate them to learn, these are also a source of continuous distraction. This research analyzes the impact of studying with handwritten notes, WhatsApp, YouTube and searching the Internet in academic performance, through a mixed method that combines 31 focus groups and a survey of 7,217 students from 12 to 18 years of age in Chile. The results of the focus groups show that the positive impact of technologies in learning would depend on the students' motivation for learning, their ability to efficiently control and manage the available digital resources, and their capacity to search and evaluate information on the Internet. The survey concludes that those who study with their notes more frequently have better academic performance, whereas those who frequently study with YouTube and WhatsApp have a lower GPA, with no significant differences when it comes to internet browsing. These results reinforce the need raised by scholars to generate policies that promote digital literacy both inside and outside the school.

RESUMEN

Con la creciente masificación de las tecnologías de información y comunicación entre los jóvenes, es cada vez más común que los estudiantes de secundaria incorporen el uso de múltiples dispositivos y plataformas en sus hábitos de estudio, lo que sería una fuente de apoyo y motivación, pero también de constante distracción. Esta investigación compara el impacto que tiene estudiar con apuntes escritos a mano, WhatsApp, YouTube y navegando por Internet, en el rendimiento académico, a través de un método mixto que combina 31 grupos focales y una encuesta a 7.217 estudiantes de 12 a 18 años en Chile. El análisis de los grupos focales muestra que el buen uso de tecnologías al estudiar dependería de la capacidad de los estudiantes para controlar y hacer un uso eficiente de los recursos digitales disponibles, de sus motivaciones individuales y de la habilidad que tienen para buscar y evaluar la información en Internet. Por su parte, los resultados de la encuesta concluyen que aquellos jóvenes que estudian con mayor frecuencia con sus apuntes presentan un promedio de calificaciones más alto y los que estudian frecuentemente con YouTube y WhatsApp, un promedio de calificaciones más bajo, sin encontrar diferencias significativas en el caso de los navegadores de Internet. Esto reforzaría la necesidad observada por académicos de generar políticas que promuevan la alfabetización digital tanto dentro como fuera del colegio.

KEYWORDS | PALABRAS CLAVE

WhatsApp, YouTube, Google, Internet, learning, academic performance, ICT adoption, digital literacy.
WhatsApp, YouTube, Google, Internet, aprendizaje, rendimiento académico, adopción de TIC, alfabetización digital.

1. Introduction and state of the art

The implementation of information and communication technologies (ICTs) in educational environments has been a constant concern in the last decades for academics and policymakers (Livingstone et al., 2018). Interestingly enough, despite the efforts of several governments to ensure universal access to ICTs, a digital divide has persisted within schools, which could be understood due to the differences in the use and appropriation of technology by students (Claro et al., 2012; Hohlfeld et al., 2017; Warschauer & Matuchniak, 2010).

Aiming to understand this situation, some scholars have questioned the approach by authors such as Prensky (2001) for proposing that both children and young people present digital and cognitive skills since birth due to their early exposure to technologies. In fact, most recent research suggests there is not enough evidence to demonstrate that these skills are present in students only from their exposure to technologies (Bullen et al., 2011; Ruíz, 2013; Sweller et al., 2007). Furthermore, it seems that the development of these digital abilities depends on how young people use them and could not be attributed to a whole generation (Cabra-Torres & Marciales-Vivas, 2009).

The Chilean case is a good example of this phenomenon: although there is an extremely high Internet penetration (87.4% of households have Internet access according to SUBTEL, 2019), only 1.8% of school students present an advanced level of skills and competences in managing online information, communication, and ethics in the digital world (Ministry of Education, 2014). These results show the need to improve digital skills and knowledge in schoolchildren (Claro et al., 2015).

Furthermore, as our modern society assimilates new and more information and communication technologies, the boundaries between school and home have broken up, as well as those between work and leisure (Furlong & Davies, 2012), creating a new context in which students can learn outside school and have leisure activities within school (Persson, 2014). Thus, technologies could support formal learning at home (Selwyn et al., 2009) as students can decide between different learning strategies in order to do their homework or study and communicate with their classmates (Furlong & Davies, 2012; García-Martín & Cantón-Mayo, 2019). Examples of these strategies may be related to how they search for online content, access different types of resources (e.g. audiovisual contents) or create digital products (Furlong & Davies, 2012; García-Valcárcel & Tejedor-Tejedor, 2017; Matamala-Riquelme, 2016; Ruiz, 2013).

Relevant to our research, previous studies have shown that the use of technologies for learning purposes can affect academic performance in two ways. On the one hand, in terms of information management, research has shown that by accessing multiple resources and different perspectives, technology can facilitate the comprehension of more complex processes and promote active learning (Noor-Ul-Amin, 2013). Thus, searching for online information could predict, for example, higher levels of academic efficiency (Shen, 2018), and it is correlated with informational literacy (Çoklar et al., 2017). Similarly, it has been observed that using technologies for learning not only increases students' motivation (Noor-Ul-Amin, 2013; Ruiz, 2013), but also their involvement and the development of transversal skills such as collaboration and self-regulated autonomous learning (Claro et al., 2015; Fazey & Fazey, 2001; Torrano-Montalvo & González-Torres, 2004; Zhang, 2015), which are positively related to academic performance (Hu et al., 2018). Likewise, research has shown that students who use technology autonomously and are able to search for information to complete their academic projects, present a greater engagement during video visualization (Guo et al., 2014).

On the other hand, scholars have observed that the use of electronic media in classes or at home is related to the implementation of more than one activity at the same time, or "multitasking", which increases students' distraction and decreases their ability to retain the information they learn (Cabañas & Korzeniowski, 2015; Flanigan & Babchuk, 2015; Matamala-Riquelme, 2016; Rosen et al., 2013). Furthermore, as they present lower capacities to control interference of information, this would negatively impact their academic performance (Bellur et al., 2015; Giunchiglia et al., 2018; Junco & Cotten, 2012). Similarly, the use of electronic media could promote counterproductive learning habits such as "copying and pasting" information from the Internet (Bellur et al., 2015), simplifying the content as they search directly for answers or summaries of what they need to learn, which negatively affect their critical thinking skills (Matamala-Riquelme, 2016). Thus, in students who lack strategies for online search, the large

amounts of information could produce a cognitive overload from multiple stimuli, without them being able to differentiate what is important (Kolikant & Ma'ayan, 2018). Taking these aspects into account, it is possible that the use of ICTs in educational contexts is displacing traditional resources, such as taking handwritten notes, a process that has been proven to improve recall and quality of information (Aragón-Mendizábal et al., 2016) as well as stimulating cognitive processes through learning strategies that positively impact academic performance (Roux & Anzures-González, 2015). This study aims to respond to two questions related to the effects of ICTs in learning processes: 1) Which aspects are considered by students in deciding how they study and which resources are they using for that purpose? 2) What impact does the use of WhatsApp, YouTube, the Internet, and handwritten notes have in academic performance?

2. Materials and methods

This investigation was exploratory in nature, based in a correlational model, carried out through a mixed methods approach.

2.1. Participants

From the universe of 11,749 educational establishments of primary and secondary education in Chile (Ministry of Education, 2018) for the qualitative analysis, a simple random sample of 11 schools in different regions of the country was selected. A total of 176 students between 12 and 18 years old were interviewed (44.8% female). For the quantitative analysis, students in the same age range were selected from 84 schools (N=7,217; 57% female) with the following distribution from the three most populated regions in the country (V, RM, and VIII): 19% from public schools, 59.5% from private subsidized schools and 21.5% from private schools. Both samples were selected randomly from schools by using prior consent from the school authorities, parents, and guardians, in accordance with the ethical norms for working with minors established by the Pontifical Catholic University of Chile.

2.2. Instruments

Students participated in 31 focus groups, each comprised of between 4 and 10 participants. Three focus groups were constituted only by female students, three were constituted only by male students, and 25 were mixed. The discussions were conducted with a semi-structured questionnaire that focused on three main topics: 1) The use of technologies for formal education; 2) The use of technologies inside the classroom, and 3) the use of technologies for studying at home.

Quantitative information was collected through a questionnaire made from the following variables (Annex 1 in https://bit.ly/2YYyJEd):

- Dependent variable: grade point average. The Chilean grading scale was used which goes from 1.0 (0% achievement) to 7.0 (100% achievement), where 4.0 is the lowest passing grade. In this case the following scale was constructed for working with the GPA: 6=6.0-7.0 (very good); 5= 5.0-5.9 (good); 4= 4.0-4.9 (sufficient); 3= 3.0-3.9 (less than sufficient); 2= 2.0-2.9 (deficient); and 1= 1.0-1.9 (very deficient).
- Independent variables: Study resources. We asked students how frequently they utilize four different resources for studying. These were measured in a Likert scale of 5 points from 1 (never) to 5 (always): handwritten notes (M=3.79; SD=1.09), search engines such as Google (M=3.74; SD=1.07), YouTube (M=2.86; SD=1.29) and WhatsApp (M=2.87; SD=1.36).
- Study strategies: According to the frequency of use of these study resources, we established four profiles by combining high-level use (always and frequently) and low-level use (never, rarely, and sometimes). In the first profile those students with high-level use of handwritten notes and low-level ICT use (YouTube, Internet, and WhatsApp) (M=5.95; SD=0.68). Profile II considered high level of ICT use and low level of handwritten notes (M=5.43; SD=0.64). Profile III included students with high levels of handwritten notes and ICT use (M=5.82; SD=0.63). Profile IV considered low levels of handwritten notes and ICT (M=5.53; SD=0.68).
- Control variables: Type of educational establishment. It was differentiated by the type of administration of Chilean schools to control for differences in: 0= State subsidized (municipal and private subsidized schools) and 1= private. Grade: it was differentiated between primary

grades, seventh and eighth grades (13-14 years old), and secondary, from first to fourth year of High School (15-18 years old).

2.3. Procedure

Both phases were conducted during school hours and members of the research team guided the focus groups and supervised the students answering the survey inside the educational establishments.

2.4. Data analysis

Transcriptions of each focus group were analyzed through axial coding with NVivo 11. This process allowed researchers to distinguish between different study practices, and to understand how students evaluate the use of handwritten notes and technologies for learning purposes. Additionally, the analysis revealed the most used resources for studying and learning, three main aspects that influence how they decide to study, and their positive and negative perceptions of their study sessions.

Data survey was analyzed with the statistical software RStudio v1.1.463 (RStudio Team, 2018-2019). To analyze the differences between groups, the researchers ran a multivariate analysis of variance (MANOVA of Fishers') and calculated the homogeneity of these using the K-squared test by Bartlett (1937). The Scheffe test was conducted as a post-hoc test to determine if the frequency of use was statistically significant. Once the MANOVA was conducted, the significance of individual and combined factors was analyzed through an eta-squared test (Kennedy, 1970). Lastly, a linear regression was estimated to establish how the learning resources (handwritten notes, searching on Internet, YouTube, and WhatsApp) impacted participants' GPA.

3. Results

3.1. Focus groups

It was determined that the most utilized devices were mobile phones (106 references) and the computer (44 references). Out of the most-mentioned study resources, the students highlighted using their handwritten notes (123 references) to review what was explained by the teacher during classes, YouTube to search for videos about contents viewed in classes (131 references), WhatsApp to share information or to ask questions to classmates (163 mentions), and search engines (153 references) (mentioned either as "Google" or "Internet") to look up more concrete content. They also mentioned specific websites and applications, such as PuntajeNacional.cl or PhotoMath (31 total references). It is worth noting that every student had access to technologies in their homes, and that they had at least one device when studying. In fact, several students recognized facing study sessions using different resources simultaneously: "I have the cellphone in case someone needs to ask me something, the computer to look up information, the notebook [written notes] to do homework or study, and the book in case I need it." (FG number 5, male, 15 years old).

When students were asked about their study practices and how they select different resources for that purpose, three aspects that have an impact on how they make these decisions were identified.

3.1.1. Control and efficient use of tools

Students recognized that the mere presence of devices made it difficult for them to regulate as they feel a constant worry to avoid checking their social media accounts (78 references), which is why many of them developed practices to eliminate stimuli that made them lose their focus (123 references). Thus, they mentioned mainly their cellphones, considering them a source of distraction, which affected them negatively by dilating the time needed to complete tasks: "Sometimes the lack of concentration is because of Instagram… studying with my classmates on WhatsApp, I always tend to open my phone and automatically, Instagram. What I have to do is uninstall it. In fact, I kind of make an attempt at logging in and it's not there, then I turn off my phone and keep studying." (FG N7, man 17 years old).

In fact, they related their distraction to their cellphones rather than to the computers, as they can access faster to their social media platforms or activities not related to the academic context through their mobile devices. Similarly, they mentioned WhatsApp and YouTube as their main sources of distraction, as both platforms take them away from their studies, which happens less frequently with search engines [through

their computers], or when studying with their notes or books. Among the positive aspects of the use of devices and platforms, they mentioned the usefulness of the resources to optimize study time for solving concrete issues (43 references), communicating with others, and working as a group without sharing a physical space (53 references): "My best friend is very good in Biology and Chemistry, but she is bad at Spanish language and History. So, we do video calls and we explain to each other, because what she does not know how to do, I know, and vice versa." (FG N4, Female, 15 years old) "For Math, I look up exercises and use the calculator. For science classes, I print what the teacher sends us, the PowerPoint, and then I study. The computer is better for me because there I can use translators, dictionaries, find exercises…" (FG N1, Male, 14 years old).

Thus, search engines and WhatsApp would be more efficient when answering concrete questions, which would happen when the students do not find or do not understand the information in their handwritten notes.

3.1.2. Personal motivations and preferences in subject and formats

According to the students, the selection of different study strategies (such as incorporating the use of technologies) would depend on the motivation generated by the content (43 references) and their preference for different resources that would allow them to focus or to entertain when studying. "It has to do with whether you like something. Actually, what I like I don't study, and what I don't like I do study. Because if I like something, I'm going to pay more attention in class and I would need less study time at home." (FG N22, male, 15 years old).

Thus, participants associated their motivation to take notes in classes in terms of how much they like the class, while the use of search engines and YouTube depended on the different purposes, such as whether they need to find out more information, to understand the relevance of the subject, or to simplify and shorten study time, among others: "In Biology, I always search on the internet because that's what I like, but everything else, I don't." (FG N23, Female, 13 years old). "… I don't study Math because I'm not interested, so in the end, when I have to study, I'm listening to music or watching videos, but in my house" (FG N7, mal 18 years old).

3.1.3. Search and evaluation of available information

The strategies to manage information with specific purposes (knowing the content needed to take a test), would depend on how the students understood and conceived the use of the Internet: they would use it differently if they saw it as a primary or a secondary source of information. This means the following: while some students would search in platforms to complement what they have been studying (169 references) (to clarify and sum up the information in their notes), other students admitted to searching as a replacement for that information (98 references), especially when they are less motivated to pay attention in class or when there is a vacuum of knowledge. "There are people who prefer not to pay attention in class… that happens to me sometimes. I decide that I'm not going to listen if I can search on the internet afterwards and learn just the same as in the class. And I think this happens to most of us." (FG N6, Male, 16 years old). "If it's History, for example, the Cold War. I search for 'Cold War' and look up different articles. Because, in order to learn something specific, I prefer to read from everywhere to reinforce what I already know and to search what I don't understand" (FG N14, woman 14 years old).

Thus, the use of handwritten notes would be useful to understand the content given by a teacher in a class when there is the main source of information, while WhatsApp, YouTube, and Internet browsers could open the possibility of accessing content given by their peers or experts (YouTube channels or specialized websites) or undetermined Internet sources. For this reason, when evaluating the quality of information, some students preferred to saturate the information (43 references) through searching on different websites, while others preferred to stay with the simplest content (64 references): "What they give you in school is always vague, it's not as profound as what I could look up beyond. There are always tricky questions in the tests where you have to infer, and people who do not have that capacity, need to look up more information to solve them." (FG N8, Female, 17 years old). "You search for a formula and go straight to the point… you search: how to solve this, and it goes directly to where they explain it, and

that's it" (FG N24, Male, 17 years old). Through this way, it can be understood how the students select their learning resources according to their individual preferences, which could vary in different situations and contexts. Thus, the different uses of technology for studying would imply difficulties and opportunities according to their own skills, motivations, and purposes.

3.2. Survey

From the qualitative results and the bibliographic research, the researchers formulated hypotheses about the relation between the use of technologies and academic performance. Firstly, and given that taking notes in class presupposes a higher interest in the subject, being more attentive in classes and recalling the information (Aragón-Mendizábal et al., 2016), it is assumed that a larger use of handwritten notes when studying would be associated to a higher GPA. On the other hand, the use of the Internet would be useful for specific doubts, but it could be thought that a higher use of the internet as a replacement for contents seen in the classroom would require a larger effort for evaluating and selecting the important information (Kolikan and Ma'ayan, 2018). A similar effect could be seen in the prolonged use of YouTube and WhatsApp, because in both cases we could assume a lesser prior understanding of the information than with the use of notes, which could speak of a lesser motivation –associated to more distractions when studying (Matamala-Riquelme, 2016)– and to the necessity of searching for complex explanations from other classmates or specialized videos. Thus, four hypotheses were formulated:

- H1: Students who study more frequently with their handwritten notes would present a higher GPA.
- H2: Students who study more frequently with search engines would present a lower GPA.
- H3: Students who study more frequently with YouTube would present a lower GPA.
- H4: Students who study more frequently with WhatsApp would present a lower GPA.

In order to corroborate the hypotheses and analyze the association between students' use of technology for study and their grade point average, three types of analysis were done. The first one, a multifactorial variance analysis (MANOVA) with post-hoc tests done through the Scheffe test, showed statistically significant differences in the means between the use of handwritten notes and the digital resources (F=1046.98 p<.001). As Table 1 illustrates, the results show that the higher grade point averages are seen in students who answered studying Always with notes (M=6.01; SD=0.576), while lower grade point averages said they used notes with a lower frequency, corroborating H1: Frequently (M=5.75; SD=0.590); Sometimes (M=5.48; SD=0.620); Rarely (M=5.39; SD=0.664); or Never (M=5.37; SD=0.744).

Regarding the relationship between frequency of search engines with academic goals (F=24.96 p<.001), there were no significant differences in grade point averages, so H2 could not be corroborated.

Table 1. Results of the analysis of variances								
Study resource	**Notes**		**Internet**		**YouTube**		**WhatsApp**	
Frequency of use	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Always	6.01[bcde]	0.57	5.71	0.61	5.63[de]	0.62	5.64[bcde]	0.63
Frequently	5.75[acde]	0.59	5.71	0.63	5.67[de]	0.63	5.71[a]	0.66
Sometimes	5.48[abde]	0.62	5.74	0.67	5.68[de]	0.66	5.73[a]	0.62
Rarely	5.39[abc]	0.66	5.76	0.69	5.80[ab]	0.64	5.77[a]	0.64
Never	5.37[abc]	0.74	5.65	0.76	5.79[ab]	0.68	5.73[a]	0.69

Note. Residual standard error 0.6063 in 7212 degrees of freedom; Multiple R2: 0.133, Adjusted R2: 0.1328; Statistical F 277.2 in 4 and 7212 dl, p<2.2e-16.

The presence of the letters a, b, c, d, and e indicate statistical significance to a level of at least p≤.05 between the measures of frequency of use reported with the grade point average in accordance with the test of significant difference in the Scheffe test.

Concerning the use of YouTube (F=39.17 p<.001), Table 1 shows significant differences between the students who claim to use it Always (M=5.63; SD=0.63), Frequently (M=5.67; SD=0.63), and/or Sometimes (M=5.68; SD=0.66), with those who use it Rarely (M=5.80; SD=0.64), or Never (M=5.79; SD=0.68), which would prove H3. A similar effect is seen in H4 with WhatsApp (F=3.651 p<.0561), though, while we can identify statistically significant differences in academic performance, the contrast is only between those who Always use it to study (M=5.64; SD=0.630) with the rest.

To corroborate the previous results, we did a series of hierarchical linear regressions displayed in Table 2. Model 2 shows that studying with handwritten notes is the factor that most influences the grade point average (β=0.17, p<0.001). Something similar can be observed in models 3, 4, and 5, where, with a higher use of notes, the better the GPA, even controlling for all the other technological resources, which would corroborate H1. For H2, as observed in Model 5, there is no significant relation between the use of search engines on the internet to study and the GPA.

Table 2. Regressions for the use of study resources					
	Model 1	Model 2	Model 3	Model 4	Model 5
Type of Educational establishment (1=Private)	0.467***	0.362***	0.35***	0.358***	0.359***
Grade (1= High School)	-0.046**	-0.080***	-0.072***	-0.068***	-0.068***
ΔR2 (%)	8.950	8.950	8.950	8.950	8.950
Notes		0.171***	0.172***	0.171***	0.170***
ΔR2 (%)		7.460	7.460	7.460	7.460
YouTube			-0.026***	-0.020***	-0.022***
ΔR2 (%)			0.240	0.240	0.240
WhatsApp				- 0.022***	-0.022***
ΔR2 (%)				0.180	0.180
Internet					0.004
ΔR2 (%)					0.010
Constant	5.656	5.052	5.123	5.167	5.159
Adjusted R2 (%)	8.950	16.410	16.650	16.830	16.840
DW	1.99	1.94	1.95	1.95	1.95

Note. All the entries are standardized coefficients. The change in R2 refers to the unique contribution of each group of variables controlling for the previous variables entered in the regression model *p<0.05, **p<0.01, ***p<0.001.

From what was observed in models 3 and 4, it can be seen that, the higher the use of YouTube (β=-0.03, p<0.001) and of WhatsApp (β=-0.02, p<0.001) to study, the lower the grade point average is, which corroborates H3 and H4, respectively.

Finally, profiles of study strategies were established (which would respond to the qualitative and quantitative analyses), which were tested with a MANOVA, which found significant differences in academic performance (F=83.26 p<.001). Table 3 shows that the students with a high use of notes and low use of ICT (profile I) present a higher GPA in comparison to those who used strategies that fit profile II (high use of ICT and low use of notes), profile III (high use of notes and ICT) and profile IV (low use of notes and ICT).

From the Scheffe test it is observed that, facing a low use of handwritten notes, independently of their level of usage of ICT, there are no statistically significant differences. In other words, facing a low use of notes when studying, in every case, the grade point average will be lower in comparison with a higher use of notes.

Table 3. Results of the study strategies analysis		
	Grades	
Study strategies	Mean	SD
Profile I	5.95[bcd]	0.64
Profile II	5.43[ac]	0.64
Profile III	5.82[bd]	0.63
Profile IV	5.53[ac]	0.68

Note. [abd] the presence of the letters a, b, and d indicate statistical significance in a level of at least p≤.05 between the means in the grade point average in accordance with the test of significant difference of the Scheffe test.

4. Discussion and conclusions

This research aimed to understand how students decide which types of resources they use for studying, and the impact that the use of WhatsApp, YouTube, the Internet, and handwritten notes have on academic performance. The research left three major results.

First, it was observed that most of the students simultaneously use different devices and platforms to study. Second, according to the opinions expressed in the focus groups, the decision of using digital

resources depends on their motivation and skills to search and evaluate information on the internet, but the efficiency would be given by their ability to regulate and control the use of these digital resources for academic purposes. Third, consistent with these results, those who study most frequently with their handwritten notes present higher grade point average, while those who frequently study with YouTube and WhatsApp present lower GPA. This is because, contrary to what was proposed by authors such as Prensky (2001), students recognize that they do not possess higher abilities to manage the information they found on the Internet nor the skills to self-regulate their use of devices when studying. For this reason, one of the main challenges that students have today is to increase their capacity to regulate their exposition to different stimuli, and to learn how to select online resources more efficiently, which facilitates the learning process (Claro et al., 2015).

Thus, the fact that the use of handwritten notes is associated to a higher GPA has two main implications. On the one hand it confirms that this method helps students to better recall the information (Aragón et al., 2016) because taking notes stimulates cognitive process (Roux & Anzures-González, 2015), and shows an active attitude and higher motivation to pay attention in classes. On the other hand, as students take notes, they are also isolating other distractions as they focus on what the teacher explains and not in the notifications they receive, with a cellphone as the main distractor. Furthermore, these results are also consistent with previous research, that increasing the probabilities of being exposed to distractions and "multi-tasking" with ICT has a negative impact on academic performance (Giunchiglia et al., 2018).

Another implication would be that technologies are a positive contribution when they are used as a support and not as a replacement for studying with notes, as the latter would diminish academic performance. Moreover, it seems that only in specific cases can technology make the study process more efficient by helping students to increase their motivation (Noor-Ul-Amin, 2013; Ruiz, 2013). Thus, it is clear that the role of teachers is fundamental regarding the in-class' contents, since, according to the focus groups, when students do not trust what the teacher is explaining or are not motivated by their manner of teaching the information, they prefer digital resources as a replacement. However, most literature agrees that most of the students do not have the skills to evaluate large amounts of information found on the internet (Coklar et al., 2017), which could explain, for instance, that the use of search engines does not yield positive results nor does the information shared via WhatsApp.

Finally, this research makes evident the need to develop programs that consider the students' need for digital literacy skills that would help them to make more efficient the use of technologies when studying, something that must be taught so that the use of ICT would go together with better academic results.

As for the limitations, it is important to mention that in both methods, only the students' perception was considered, and their skills were not measured. While the research, in its qualitative and quantitative phases, was done in a similar sample of students, each one had a different objective. This way, the focus groups inquired on the vision and interpretation of positive and negative aspects of their learning, while the quantitative results showed the relation between the frequencies of use of ICT that they did say they had in their study and academic performance. For this reason, it is suggested for future research to include specific questions about their use of devices in a qualitative phase and an evaluation of their skills when using ICTs to achieve learning goals outside the classrooms. Finally, it is also important to note the digital divide between the type of educational establishments, public or private, something that is not discussed in this article, which is why it is suggested to work on this aspect separately in the future, due to its great importance.

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References

Aragón-Mendizábal, E., Delgado-Casas, C., Navarro-Guzmán, J.I., Menacho-Jiménez, I., & Romero-Oliva, M.F. (2016). Análisis comparativo entre escritura manual y electrónica en la toma de apuntes de estudiantes universitarios. [A comparative study of handwriting and computer typing in note-taking by university students]. *Comunicar*, *48*, 101-107. https://doi.org/10.3916/C48-2016-10
Bellur, S., Nowak, K.L., & Hull, K.S. (2015). Make it our time: In class multitaskers have lower academic performance.

Computers in Human Behavior, *53*, 63-70. https://doi.org/10.1016/j.chb.2015.06.027

Bullen, M., Morgan, T., & Qayyum, A. (2011). Digital learners in Higher Education: Generation is not the issue. *Canadian Journal of Learning and Technology*, *37*(1), 1-24. https://doi.org/10.21432/t2nc7b

Cabañas, M., & Korzeniowski, C. (2015). Uso de celular e Internet: Su relación con planificación y control de la interferencia. *Revista Argentina de Ciencias del Comportamiento*, *7*(1), 5-16. https://bit.ly/2xjnPgJ

Cabra-Torres, F., & Marciales-Vivas, G. (2009). Nativos digitales: ¿Ocultamiento de factores generadores de fracaso escolar? *Revista Iberoamericana de Educación*, *50*, 113-130. https://doi.org/10.35362/rie500665

Claro, M., Cabello, T., Martín, E.S., & Nussbaum, M. (2015). Comparing marginal effects of Chilean students' economic, social and cultural status on digital versus reading and mathematics performance. *Computers & Education*, *82*, 1-10. https://doi.org/10.1016/j.compedu.2014.10.018

Claro, M., Preiss, D.D., Martín, E.S., Jara, I., Hinostroza, J.E., ... Nussbaum, M. (2012). Assessment of 21st century ICT skills in Chile: Test design and results from high school level students. *Computers & Education*, *59*(3), 1042-1053. https://doi.org/10.1016/j.compedu.2012.04.004

Çoklar, A.N., Yaman, N.D., & Yurdakul, I.K. (2017). Information literacy and digital nativity as determinants of online information search strategies. *Computers in Human Behavior*, *70*, 1-9. https://doi.org/10.1016/j.chb.2016.12.050

Fazey, D.M.A., & Fazey, J.A. (2001). The potential for autonomy in learning: Perceptions of competence, motivation and locus of control in first-year undergraduate students. *Studies in Higher Education*, *26*(3), 345-361. https://doi.org/10.1080/03075070120076309

Flanigan, A.E., & Babchuk, W.A. (2015). Social media as academic quicksand: A phenomenological study of student experiences in and out of the classroom. *Learning and Individual Differences*, *44*, 40-45. https://doi.org/10.1016/j.lindif.2015.11.003

Furlong, J., & Davies, C. (2012). Young people, new technologies and learning at home: taking context seriously. *Oxford Review of Education*, *38*(1), 45-62. https://doi.org/10.1080/03054985.2011.577944

García-Martín, S., & Cantón-Mayo, C. (2019). Uso de tecnologías y rendimiento académico en estudiantes adolescentes. [Use of technologies and academic performance in adolescent students]. *Comunicar*, *59*, 73-81. https://doi.org/10.3916/C59-2019-07

García-Valcárcel, A., & Tejedor-Tejedor, F. (2017). Percepción de los estudiantes sobre el valor de las TIC en sus estrategias de aprendizaje y su relación con el rendimiento. *Educación XX1*, *20*(2), 137-159. https://doi.org/10.5944/educxx1.19035

Giunchiglia, F., Zeni, M., Gobbi, E., Bignotti, E., & Bison, I. (2018). Mobile social media usage and academic performance. *Computers in Human Behavior*, *82*, 177-185. https://doi.org/10.1016/j.chb.2017.12.041

Guo, P.J., Kim, J., & Rubin, R. (2014). How video production affects student engagement. In *Proceedings of the First ACM Conference on Learning @ Scale Conference* (pp. 41-50). ACM. https://doi.org/10.1145/2556325.2566239

Hohlfeld, T.N., Ritzhaupt, A.D., Dawson, K., & Wilson, M.L. (2017). An examination of seven years of technology integration in Florida schools: Through the lens of the Levels of Digital Divide in Schools. *Computers & Education*, *113*, 135-161. https://doi.org/10.1016/j.compedu.2017.05.017

Hu, X., Gong, Y., Lai, C., & Leung, F.K. (2018). The relationship between ICT and student literacy in mathematics, reading, and science across 44 countries: A multilevel analysis. *Computers & Education*, *125*, 1-13. https://doi.org/10.1016/j.compedu.2018.05.021

Johnston, M.J., King, D., Arora, S., Behar, N., Athanasiou, T., ... Darzi, A. (2015). Smartphones let surgeons know WhatsApp: an analysis of communication in emergency surgical teams. *The American Journal of Surgery*, *209*(1), 45-51. https://doi.org/10.1016/j.amjsurg.2014.08.030

Junco, R., & Cotten, S.R. (2012). No A 4 U: The relationship between multitasking and academic performance. *Computers & Education*, *59*(2), 505-514. https://doi.org/10.1016/j.compedu.2011.12.023

Kolikant, Y.B.D., & Ma'ayan, Z.E. (2018). Computer science students' use of the Internet for academic purposes: Difficulties and learning processes. *Computer Science Education*, *28*(3), 211-231. https://doi.org/10.1080/08993408.2018.1528045

Livingstone, S., Mascheroni, G., & Staksrud, E. (2018). European research on children's internet use: Assessing the past and anticipating the future. *New Media & Society*, *20*(3), 1103-1122. https://doi.org/10.1177/1461444816685930

Mahamud, K., & Badanelli, A.M. (2017). O caderno escolar como objeto de estudo: uma aproximação dos avanços metodológicos em manualística. *Educação e Fronteiras*, *7*, 42-66. https://doi.org/10.30612/eduf.v7i20.7427

Matamala-Riquelme, C. (2016). Uso de las TIC en el hogar: Entre el entretenimiento y el aprendizaje informal. *Estudios pedagógicos*, *42*(3), 293-311. https://doi.org/10.4067/s0718-07052016000400016

Ministerio de Educación (Ed.) (2014). Informe de resultados SIMCE TIC 2° Medio 2013. https://bit.ly/2cGsefS

Ministerio de Educación (Ed.) (2017). Estadísticas de la Educación 2017. https://bit.ly/3a8Rckk

Moghavvemi, S., Sulaiman, A., Jaafar, N.I., & Kasem, N. (2018). Social media as a complementary learning tool for teaching and learning: The case of YouTube. *The International Journal of Management Education*, *16*(1), 37-42. https://doi.org/10.1016/j.ijme.2017.12.001

Noor-Ul-Amin, S. (2013). An effective use of ICT for education and learning by drawing on worldwide knowledge, research and experience: ICT as a change agent for education. *Scholarly Journal of Education*, *2*(4), 38-54. https://bit.ly/2Tb2DTX

Persson, M. (2014). No, Facebook isn't distracting me, I can study at night': ICT habits and boundary management among Estonian secondary pupils. *Studies of Transition States and Societies*, *6*(2), 22-38. https://bit.ly/35DFlJ2

Prensky, M. (2001). Digital Natives, Digital Immigrants Part 1. *On the Horizon*, *9*, 1-6. https://doi.org/10.1108/10748120110424816

Rosen, L.D., Carrier, L.M., & Cheever, N.A. (2013). Facebook and texting made me do it: Media-induced task-switching while studying. *Computers in Human Behavior*, *29*(3), 948-958. https://doi.org/10.1016/j.chb.2012.12.001

Roux, R., & González, E.E.A. (2015). Estrategias de aprendizaje y su relación con el rendimiento académico en estudiantes de una escuela privada de educación media superior. *Actualidades Investigativas en Educación*, *15*(1), 1-16.

https://doi.org/10.15517/aie.v15i1.17731

Ruiz, P.A. (2013). Nuevas tecnologías y estudiantes chilenos de secundaria: Aportes a la discusión sobre la existencia de nuevos aprendices. *Estudios Pedagógicos*, *39*(2), 279-298. https://doi.org/10.4067/S0718-07052013000200018

Selwyn, N., Potter, J., & Cranmer, S. (2009). Primary pupils' use of information and communication technologies at school and home. *British Journal of Educational Technology*, *40*(5), 919-932. https://doi.org/10.1111/j.1467-8535.2008.00876.x

Shen, C.X. (2018). Does school-related Internet Information seeking improve academic self-efficacy? The moderating role of Internet information seeking styles. *Computers in Human Behavior*, *86*, 91-98. https://doi.org/10.1016/j.chb.2018.04.035

SUBTEL (Ed.) (2019). *Primer trimestre 2019, Informe trimestral del sector telecomunicaciones.* Gobierno de Chile. https://bit.ly/2oJhZ4c

Sweller, J., Kirschner, P., & Clark, R. (2007). Why minimally guided teaching techniques do not work: A reply to commentaries. *Educational Psychologist*, *42*(2), 115-121. https://doi.org/10.1080/00461520701263426

Torrano-Montalvo, F., & González-Torres, M. (2004). El aprendizaje autorregulado: Presente y futuro de la investigación. *Electronic Journal of Research in Educational Psychology*, *2*(1), 1-3. https://doi.org/10.25115/ejrep.3.120

Warschauer, M., & Matuchniak, T. (2010).). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education*, *34*, 179-225. https://doi.org/10.3102/0091732x09349791

Zhang, W. (2015). Learning variables, in-class laptop multitasking and academic performance: A path analysis. *Computers & Education*, *81*, 82-88. https://doi.org/10.1016/j.compedu.2014.09.012

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Teachers' mediation practice: Opportunities and risks for youth media behavior

Prácticas de mediación docente: Oportunidades y riesgos en el comportamiento mediático de jóvenes

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ABSTRACT

Research with children and adolescents shows that teachers are one of the agents from whom they receive mediation of their media use. However, little is known about teachers' mediation practice. This study aims to approximate teachers' practice with the concept of mediation by, firstly, systematizing a set of curricular media-related competences into the goals of maximizing opportunities and minimizing risks in youngsters' media behavior. Then, teachers' professional and personal characteristics are tested for associations with the mediation of risks and opportunities of students' media use. Data collected in a survey with 315 teachers in Germany were analyzed. Results of regression analysis show that most factors predicted both opportunities and risks in a similar way. Teachers are more engaged in maximizing opportunities and minimizing risks when they use information and communication technologies (ICT) more frequently, consider the respective competences important, engage in collaboration with colleagues, do not teach STEM subjects, and do not work in a Gymnasium. Having received ICT-related training was a significant predictor only of mediation of opportunities, while age was a significant predictor only of mediation of risks. Implications of the findings and how the concept of mediation can contribute to the development of teachers as media educators are discussed.

RESUMEN

Estudios con niños y adolescentes han mostrado que los profesores son uno de los agentes de quien reciben la mediación en el uso de los medios. Sin embargo, poco se conoce sobre las prácticas de mediación docente. El objetivo de este estudio es aproximar la práctica docente con el concepto de mediación a través de, en primer lugar, la sistematización de un conjunto de competencias curriculares relacionadas con los medios, con el objetivo de maximizar las oportunidades y minimizar los riesgos en el comportamiento mediático de los jóvenes. Posteriormente, se examinan las características de los profesores para buscar asociaciones con la mediación de riesgos y oportunidades del uso de los medios por parte de los estudiantes. Se analizaron datos recogidos en una encuesta con 315 profesores en Alemania. Los resultados del análisis de regresión muestran que los profesores están más comprometidos en maximizar las oportunidades y minimizar los riesgos cuando utilizan las TIC con más frecuencia, consideran importantes las respectivas competencias, colaboran con colegas, no enseñan asignaturas en STEM y no trabajan en escuelas del tipo Gymnasium. Haber recibido capacitación relacionada con las TIC fue un factor significativo solo de la mediación de oportunidades, mientras que la edad fue un factor significativo solo de la mediación de riesgos. Finalmente, se discuten cómo el concepto de mediación puede contribuir al desarrollo de los profesores como educadores de medios.

1. Introduction

The necessity to educate children and adolescents to cope with the risks and seize the opportunities associated with digital media is widely recognized. Minimizing risks and expanding opportunities in online use are goals of media education expressed in practices such as mediation exercised by socializing agents (Kirwil, 2009; Livingstone et al., 2017) and the fostering of Media and Information Literacy (MIL) (Hobbs, 2010; KMK, 2012; Pöttinger & Meister, 2014).

Mediation is defined as "management of the relation between child and media" (Livingstone & Helsper, 2008: 581), while fostering MIL refers to teaching about media, usually in the context of schools (Berger & Wolling, 2019; Hatlevik & Hatlevik, 2018; Lorenz et al., 2019). In the research about the mediation of children and adolescents' media use, parents have received the most attention (Mendoza, 2009). Indeed, studies frequently point out that parents are the primary agents from whom children and adolescents report receiving mediation of online media use (Jiménez-Iglesias et al., 2015; Livingstone et al., 2011; Shin & Lwin, 2017). However, research also shows that teachers have been recognized as influential mediating agents of children and adolescents' safe internet use (Jiménez-Iglesias et al., 2015; Kalmus et al., 2012; Shin & Lwin, 2017; Tejedor & Pulido, 2012).

Thus, it is relevant to understand teachers' mediation practices in the media education of youngsters. Nevertheless, most of what is known about teachers as mediating agents was investigated from the perspective of children and adolescents. Some studies explored the perspective of parents, pointing out, for instance, the mediation strategies adopted and the associations of parents' characteristics with different mediation strategies (Lee, 2013; Livingstone et al., 2017; Nikken & Jansz, 2014; Nikken & Schols, 2015). Nevertheless, the perspective of teachers about mediation activities remains scarcely researched.

Teachers' practices in media education have been studied mostly in terms of their integration of information and communication technologies (ICT) for instruction (Ertmer, 2005; Knezek & Christensen, 2016; Petko, 2012) and their fostering of students' MIL (Lorenz et al., 2019; Hatlevik & Hatlevik, 2018; Siddiq et al., 2016). Nevertheless, it is unclear whether the teachers' practices of fostering students' MIL and mediation of students' media use are equivalent. Although both practices share common goals, they are usually discussed individually, as Mendoza remarked, "parental mediation and media literacy are two fields that have not often crossed paths" (2009: 29). Considering the research about teachers as media educators, this also seems to be the case.

This study aims to connect the concepts of fostering MIL and mediation in the teacher's practice. Firstly, it systematizes a set of curricular media-related competences according to what is common ground between the two practices: the functions of maximizing opportunities and minimizing risks in youngsters' media use. Secondly, it explores teachers' professional and personal characteristics associated with the mediation of risks and opportunities in students' media use. Therefore, data collected in a survey with 315 teachers of secondary schools in the state of Thuringia, Germany, are analyzed.

1.1. Teachers as media educators

The role of teachers as media educators is frequently associated with a curriculum. Media education curricula in Europe tend to follow frameworks of MIL, digital, and computer literacy (Frau-Meigs et al., 2017). Taking as an example the state of Thuringia, Germany, its media education guideline for secondary schools, called "Kursplan Medienkunde," consists of a list of competences that students should develop. Typically, secondary schools in Germany have students between 10 and 18 years old. Findings of the study by Brüggen et al. (2017) show that parents in Germany consider 11-12 years the most critical age in terms of online risks for their children. Thus, media education in secondary schools can target this critical group as well as older children and adolescents.

The "Kursplan Medienkunde" has seven competence areas: 1) Information and data; 2) Communication and cooperation; 3) Media production; 4) Presentation techniques; 5) Analysis and assessment; 6) Media and society; 7) Law, data security, and youth media protection. In an evaluation report of the guideline, Wolling and Berger (2018) observed that the competence areas of the "Kursplan Medienkunde" are consonant with the ones proposed by well-known references, such as the European Digital Competence Framework (Ferrari, 2013), the Framework of the Partnership for 21st Century

Learning (2015), and the UNESCO Media and Information Literacy Framework (UNESCO, 2013). Teachers usually carry the primary responsibility in schools for developing MIL competences with their students (Brüggemann, 2013). In German school curricula, media literacy is not a subject but should be taught in the realm of traditional school subjects instead (KMK, 2012). Thus, schools and individual teachers usually have the freedom to decide which media competences will be addressed in each subject. Despite guidelines of media education, Hartai observed that, not only in Germany, but also in the member countries of the European Union in general, it is not clear who should teach media education and with what qualifications, and "there is no single or well-defined focus of media literacy in formal education" (2014: 67). Due to this lack of firm establishment of media literacy in the school curricula, it is likely to exist considerable variance in the efforts that teachers invest in fostering MIL.

Studies addressed this variance and identified the following positive predictors of teachers' fostering of their students' media-related competences: adopting ICT for instruction more frequently (Berger & Wolling, 2019; Hatlevik & Hatlevik, 2018; Lorenz et al., 2019; Siddiq et al., 2016), having more positive attitudes towards the value of ICT for instruction (Berger & Wolling, 2019; Hatlevik & Hatlevik, 2018; Karaseva et al., 2015; Siddiq et al., 2016), feeling better prepared to deal with ICT (Hatlevik & Hatlevik, 2018; Siddiq et al., 2016), collaborating with other teachers to exchange knowledge and experiences about media education (Lorenz et al., 2019), teaching humanities subjects (Berger & Wolling, 2019; Siddiq et al., 2016), and teaching in specific types of schools (Berger & Wolling, 2019). Among these studies that explore the teacher's perspective, only the study by Karaseva et al. (2015) addresses the fostering of media-related competences as mediation. Otherwise, most of the studies that refer to teachers as mediating agents investigated mediation from the perspective of children and adolescents, not of teachers. Consequently, the question arises of whether it is only a matter of terminology, or if there are differences in the teachers' practices of fostering students' MIL and mediating students' media use.

Different from MIL frameworks, the concept of mediation of children and adolescents' media use does not usually establish competences as goals. Therefore, it is less applicable in a curricular format. Concepts of mediation develop around the idea of adopting strategies to influence children's and adolescents' media use (Kalmus, 2013; Kirwil, 2009). Thus, mediation happens concerning a minor's natural media behavior (Livingstone & Helsper, 2008), influencing, managing, or shaping it through different kinds of intervention or strategies. In the literature, five main types of mediation strategies are identified: 1) Restriction through rules and limitations of determined aspects of the media usage, e.g., time or access to particular contents; 2) Co-use, when the agent and the minor engage together in a shared media activity; 3) Monitoring, when the agent verifies details about the minor's media use in records left on devices (e.g., browser history, chat logs); 4) Supervision, when the agent observes what the minor is doing with the media while the activity is happening; 5) Active mediation, when the agent instructs and talks to the minor about media content or media use (Bartau-Rojas et al., 2018; Livingstone & Helsper, 2008; Nikken & Jansz, 2014; Nikken & Schols, 2015; Smahelova et al., 2017).

Mendoza (2009) discussed possible connections between different types of mediation and media literacy, focusing on parents as media educators in regard to children's television consumption. For instance, the author connects restrictive mediation to a protectionist approach to media education, observing that advice materials addressed to parents frequently suggest adopting restrictions to children's media use. This creates an idea that restriction is the easiest way to protect minors from harm that media may cause. When it comes to active mediation, Mendoza argues that it is "the type of mediation most closely aligned with media literacy" (2009: 36) since it consists of talking to the minor about media use.

In their study with teachers from Estonia and Latvia, Karaseva et al. (2015) found out that teachers engaged mostly in active mediation and co-use to teach competences that help students identify opportunities in online media use and develop critical thinking. Teachers also reported adopting social and technical restrictions to try to protect students from potentially harmful online content. These findings suggest that the fostering of media-related competences happens through practices of (mainly active) mediation. Thus, the boundaries between the practices of mediation and fostering MIL are not clear, and both practices can happen interchangeably. Therefore, instead of looking at teachers' efforts in specific curricular areas of media literacy, this study seeks to approximate the concepts of fostering MIL and of

mediation. Therefore, it systematizes teachers' practice according to what the two concepts share in common: the goals of expanding opportunities and reducing risks in students' media use.

1.2. Mediation of online risks and opportunities

Livingstone and Haddon (2009) proposed a classification of risks and opportunities in online media use in the areas of content, contact, and conduct (Table 1). These areas correspond to situations that children and adolescents are likely to engage in when they are online. The area of content refers to when the minor is a recipient, and thus, encounters opportunities and risks in the content available online to everyone. The area of contact considers the minor as a participant in a communicational situation, in which the minor engages in interactions with other people, mainly peers and adults. Finally, in the area of conduct, the minor is an actor, who initiates the interactions with others. Brüggen et al. (2017) proposed the additional area of contract, referring to financial costs that may occur due to unintentional in-app purchases and subscriptions, which can be done with a few clicks, especially on smartphones. However, this area was connected only to risks.

Table 1. Examples of online opportunities and risks for minors		
Area	**Opportunities**	**Risks**
Content	Educational resources Global information Advice (personal/health/ sex)	Advertising, spam, sponsorship Violent/ hateful/ harmful sexual content Racist, biased info/ advice (e.g., drugs)
Contact	Exchange among interest groups Being invited, inspired to create/ participate Social networking, shared experiences	Tracking/harvesting personal information Being bullied, harassed or stalked Meeting strangers, being groomed
Conduct	Concrete forms of civic engagement User-generated content creation Expression of identity	Gambling, illegal downloads, hacking Bullying or harassing another Creating/uploading pornographic material

Note. Livingstone & Haddon, 2009: 10.

Research that tested factors associated with mediation of risks and opportunities focused only on parents so far, i.e., the associations were tested only regarding parents' characteristics and the types of mediation they tend to adopt. The literature employed restrictive, active and enabling mediation as outcome variables, where restrictive mediation corresponds mostly to the mediation of risks (Mendoza, 2009), enabling mediation tends to favor opportunities (Livingstone et al., 2017), and active mediation can target either risks or opportunities (Nathanson, 2002). In different studies, a higher level of digital skills was associated with more frequent employment of restrictive mediation (Lee, 2013; Livingstone et al., 2017; Nikken & Jansz, 2014) and also with enabling mediation (Livingstone et al., 2017). However, when it comes to usage, Nikken and Jansz (2014) found that parents who use the internet less frequently tended to employ restrictions more often. Similarly, Nikken and Schols (2015) found a negative association between the amount of time that parents spend with media (TV, computers, or touchscreens) and the frequency that they apply restrictive and active mediation. In terms of demographics, most types of mediations tended to be adopted more frequently by female parents (Livingstone et al., 2017; Nikken & Jansz, 2014), although adoption of technical restrictions was an exception (Nikken & Jansz, 2014). Finally, the age of the parent was negatively associated with enabling mediation but positively associated with restrictive mediation (Livingstone et al., 2017).

This study attempts to approximate the concept of fostering media literacy with the concept of mediation by focusing on the fostering of competences that aim to expand opportunities and the ones that aim to counteract risks in students' media use, with the research question:

RQ: How can teachers' efforts in mediating opportunities and risks of students' media use be explained?

Based on the literature about teachers' fostering of MIL, factors are tested as predictors of both opportunities and risks. Positive associations are expected with regular use of ICT in class, positive attitudes towards media education, training, and collaboration with colleagues. In contrast, negative associations are hypothesized with teaching science, technology, engineering, and mathematics (STEM) and teaching at a Gymnasium. In the German school system, Gymnasium is a type of school that emphasizes the preparation for entering higher education and is selective. Thus, it is considered more differentiated from other school types. Based on the studies with parents, mediation of both risks and opportunities are expected to be

negatively associated with private digital use and positively associated with being female. Age is expected to predict risks positively and opportunities negatively.

2. Methods
2.1. Data collection and sample
The study employs data of a survey conducted with secondary teachers in 2017 in the state of Thuringia, Germany. From the secondary schools of the state (approx. 468 with 12,100 teachers), 88 schools were randomly selected to participate in the voluntary survey. The principals of the selected schools were asked to distribute the questionnaire among the teachers in their school. Besides the link to the online survey, schools also received printed questionnaires with a pre-stamped envelope. Thus, teachers could answer the online or the paper version of the questionnaire.

The sample of the study consists of 315 teachers (response rate of 12%). The majority are female (72%) and older than 50 (53%). Half (50%) have over 25 years of experience in the teaching practice. The characteristics of the sample are similar to the teachers' population in Thuringia (Thüringer Ministerium für Bildung, Jugend und Sport, 2018).

2.2. Measures
Mediation of risks and opportunities. Teachers were asked how frequently they would conduct activities in their classes aiming to foster several media-related competences in their students on a scale from 1=never to 5=very frequently. Within these competences were identified the ones aimed at minimizing risks and maximizing opportunities in the dimensions of content, contact, and conduct, based on Livingstone and Haddon (2009). The dimension of contract (Brüggen et al., 2017) was not adopted because it refers only to risks. The sets of competences were tested with a principal component analysis. The factor solution delivered two dimensions that together explained 63% of the variance (Table 2). The dimensions were consonant with the framework proposed by Livingstone and Haddon (2009). The only exception was "Following the adequate norms for online communication," which was initially identified as addressing the risk of conduct (i.e., avoid that students perpetrate cyberbullying or hate speech). However, in the analysis, it loaded in the dimension of opportunities. Due to this contradiction, the item was excluded from the composite scales. All the other items had their scales averaged to build two composite scales: teachers' mediation of online opportunities and teachers' mediation of online risks.

Table 2. Principal component analysis: Factors loading		
Item	Opportunities	Risks
Content: Searching for information effectively	.75	
Content: Filtering and interpreting information from different sources	.83	
Contact: Using media in cooperation with others to achieve common goals	.80	
Contact: Choosing media adequately for communicating with different partners	.69	
Conduct: Producing digital media outputs creatively	.56	
Conduct: Choosing adequate media for specific purposes	.66	
Conduct: Following the adequate norms for online communication*	.61	
Content: Differentiating between advertising and journalistic content		.70
Content: Surfing safely on the Internet		.81
Content: Understanding how personal data is gathered and used further while using online media		.83
Contact: Dealing properly with cyberbullying		.72
Contact: Protecting data and the private sphere effectively		.85
Conduct: Using online content in observation of copyrights		.72
Conduct: Evaluating the danger of media addiction		.74
Explained variance	.34	.29
Eigenvalue	7.19	1.58
Cronbach's alpha	.86	.92
Mean (SD)	3.20(0.74)	3.34(0.86)

Note. Bartlett's K^2=52.21, p<.001; KMO=.92; Rotation method: Varimax. Only loadings > .40 displayed. * Item excluded from the composite scale.

- ICT use in class. Teachers were asked how often they use a set of 12 ICTs to conduct activities with their students in class on a scale from 1=never to 5=several times a week. The items were averaged, resulting in a composite scale indicating frequency of use of ICT with students in class (alpha=0.90, M=2.83, SD=0.88).
- Importance of risks and opportunities. Teachers were asked how important they consider that students develop each of the competences in Table 2 on a scale from 1=not important at all to 5=very important. The items were averaged to build the composite scales of importance attributed to competences that address opportunities (alpha=0.70, M=3.98, SD=0.46) and to competences that address risks in students' online use (alpha=0.77, M=4.43, SD=0.41).
- Training. Teachers were asked whether they received in-service or pre-service training on how to teach students about media use. The answer options were 0=no or 1=yes (yes=37.10%).
- Collaboration. Teachers were asked whether they learned about how to teach students about media use through exchanges with other teachers. The answer options were 0=no or 1=yes (yes=46.30%).
- Private digital media use. A question asked how important teachers consider the internet, computers, smartphones, and social media for their private use. For each item, the possible answers were on a scale from 1=not important at all to 5=especially important. These four items were averaged to build a composite scale of importance of digital media for private use (alpha=0.76, M=3.68, SD=0.72).
- School subjects taught. Teachers were asked whether they taught biology, chemistry, mathematics, physics, and informatics. The answer options were 0=no or 1=yes. Those who answered "yes" in one or more items were grouped to indicate the teachers involved in the instruction of STEM subjects (yes=44.48%).
- Type of school. Among five types of schools of the German school system operating in the state of Thuringia, teachers were asked to indicate the type of school where they teach. As the main differences exist between Gymnasium and other types of schools, the reference measure was set to Gymnasium, with answer options 0=no or 1=yes (yes=35.83%).
- Age and gender. Teachers were asked to choose in which of seven age groups they belonged, ranging from 1=up to 29 years old until 7=55 or older (largest group 7=34.30%). In addition, teachers were asked to inform their gender 0=female, 1=male (female=72%).

2.3. Data analysis

The hypothesized associations were tested with linear regression analyses so that the effects of each predictor can be verified when the remaining predictors in the model are held constant. One regression model was calculated for opportunities, and another for risks. Bivariate correlations between the predictors and variance inflation factors did not indicate multicollinearity problems.

3. Results

The findings shown in Table 3 point out that teachers' mediation of online opportunities are positively and significantly associated with teachers' use of ICT for instruction, the level of importance that teachers attribute to the competences that emphasize opportunities in media use, having received ICT-related training, and having collaborated with colleagues in ICT issues. Teaching STEM subjects and teaching at a Gymnasium associate negatively and significantly with the mediation of opportunities. The effects of importance attributed to competences that emphasize risks, private digital media use, age, and gender are close to zero. When it comes to the mediation of risks, positive and significant associations were found with the use of ICT in class, the importance attributed to competences that emphasize risks in media use, ICT collaboration with colleagues, and age. Teaching STEM subjects and teaching at a Gymnasium predicted mediation of risks negatively and significantly. No significant associations were found with importance attributed to competences that emphasize opportunities, having received training in ICT, private digital media use, and gender. The models explain 52% of the variance in the mediation of opportunities and 51% in the mediation of risks.

Table 3. Regression models of teachers' mediation of opportunities and mediation of risks		
Predictors	**Opportunities**	**Risks**
	Standardized coefficients	
Use of ICT in class	.53***	.48***
Importance opportunities	.27***	.07 n.s.
Importance risks	.02 n.s.	.26***
Training	.16**	.08 n.s.
Collaboration	.15**	.12*
School type (Gymnasium=1)	-.12*	-.15**
Subject (STEM=1)	-.10*	-.13*
Private digital media use	-.03 n.s.	.03 n.s.
Age	-.06 n.s.	.21***
Gender (male=1)	-.03 n.s.	-.10 n.s.
N	231	231
R^2	0.52	0.51
F	23.77***	22.69***

Note. *** p<.001; **p<.01; *p<.05; n.s.=p > .05. Confidence level: 95%, margin of error: 5.5.

4. Discussion and conclusion

Based on theoretical and statistical analyses, a set of competences distributed in seven areas in the "Kursplan Medienkunde" was rearranged into the goals of maximizing opportunities and minimizing risks in students' media use. Besides presenting another way of organizing media-related competences, the study tested factors associated with emphasizing opportunities and risks. The significant associations found are mostly consonant with findings of studies that predicted traditional areas of MIL. These results indicate that fostering media literacy and mediating students' media use are closely related and blend in teachers' practice. When teachers' are addressing the fostering of competences established in a media literacy curriculum, they are likely to mediate their students' media use. Thus, it is pertinent to question whether it is beneficial for schools to adopt frameworks of media literacy that consist of several different areas of competence. Such guidelines with multiple areas might look challenging, too comprehensive, and unclear to some teachers, especially when many teachers in charge of MIL education do not have specific training for it (Hartai, 2014).

Also, most factors predicted both opportunities and risks in a similar way in terms of significance, strength, and direction of effects. This finding suggests that mediating opportunities and mediating risks do not compete with each other in teachers' practice. Similarly, Livingstone et al. (2017) found that enabling and restrictive mediation are applied in a mixed way by parents. The strong associations with using ICT for instruction raise the possibility that besides active mediation, co-use may be a mediation practice employed by teachers, as already signalized by Karaseva et al. (2015). However, co-use at school might differ considerably from co-use at home. For instance, at school, co-use might be initiated more frequently by teachers and be paired with active mediation. Conversely, at home, children might have more opportunities to initiate co-use with parents.

The findings also confirm that teachers' favorable attitudes toward media education are crucial for their engagement in practices involving media (Ertmer, 2005; Karaseva et al., 2015; Knezek & Christensen, 2016). Nevertheless, ICT training associated significantly only with the mediation of opportunities. Possibly, teachers are more frequently trained to focus on opportunities rather than on risks that media offer, as Trültzsch-Wijnen et al. (2017) observe, that media education in Europe has moved to a focus on efficiency and operational skills. However, research shows that parents and students believe that teachers share responsibility in the mediation of risks (Brüggen et al., 2017; Tejedor & Pulido, 2012). Therefore, teacher training should respond accordingly. In regards to collaboration with colleagues, it seems that encouraging exchanges between teachers can contribute to their engagement in media education practices (Hatlevik & Hatlevik, 2018), including mediation of opportunities and risks. Since colleagues tend to share similar work conditions and the same school culture, collaborating with other teachers might be more efficient than external training, which cannot consider the individual school environment.

Concerning the negative associations with teaching STEM subjects, it seems that some school subjects like humanities favor the fostering of topics related to media use, especially the ones that refer to critical competences (Siddiq et al., 2016; Fraillon et al., 2020). Regarding the school where teachers work, as

MIL is not part of the "Abitur," the tests that are evaluated for admission in higher education programs in Germany, Gymnasium teachers seem to prioritize less the mediation of students' media use. Moreover, students' socioeconomic conditions might play a role. On an international basis, there is a positive association between students' ICT competence level and their socioeconomic status (Fraillon et al., 2020). In Germany, students from families with higher socioeconomic status are more likely to attend a Gymnasium (Wernstedt & John-Ohnesorg, 2008). Thus, Gymnasium teachers might perceive that the students are competent enough regarding opportunities and risks in media use and so, do not feel the urge to engage regularly in mediation practices.

Concerning teachers' personal characteristics, only age was associated with the mediation of risks. It is possible that older teachers might be more sensitive to the potential harm that media may cause and, thus, give higher priority to approach risks in media use. Contrary to the research about parental mediation, no associations were found with gender and private media use. Parents' media habits and the duties of male and female parents reflect the values of the family. While these values influence parents' active mediation, teachers' mediation is expected to occur according to the culture, processes, and curriculum of the school as well as their professional experience and attitudes, instead of personal habits, values, and opinions.

This study challenges to look at teachers' fostering of MIL as mediation of opportunities and risks of students' media use. Schools could consider implementing simplified media education guidelines that aim at the fostering of competences that emphasize opportunities and risks in media use. This approach could be able to involve more teachers in media education for being more straightforward and appealing than guidelines with several competence areas. Also, making explicit the goals of maximizing opportunities and minimizing risks might help teachers become aware of their relevance in mediating students' media use. Moreover, teachers must be conscious that online environments are dynamic and bring regularly new opportunities and risks, resulting in a big challenge for keeping curricula and training up to date (Frau-Meigs et al., 2017). In this sense, collaboration and informal exchanges among teachers have good potential to overcome this question. While there is no indication from research that the relevance of MIL contents varies significantly according to children's age, the effects of mediation strategies vary (Chen & Shi, 2019). Thus, it could be pertinent that media education guidelines for schools consider including, besides curricular competences, the mediation strategies that teachers can use to foster MIL in different school years. However, for this purpose, more research is needed about teachers' mediation strategies and their potential impacts.

This study is a secondary analysis of existing data. Thus, it is necessary to acknowledge limitations regarding the validity of the measures of mediation practices. Teachers' mediation of opportunities and risks in students' media use was not directly measured. Instead, in the original instrument, the teachers' fostering of competences in the seven areas of the "Kursplan Medienkunde" was measured. In terms of strategies, it was possible only to assume that teachers fostered these competences mainly by active mediation (Karaseva et al., 2015; Mendoza, 2009). Future studies should focus clearly on developing measures of teachers' mediation strategies. Then, it will be possible to explore associations between the fostering of specific media-related literacies and mediation strategies adopted.

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References

Bartau-Rojas, I., Aierbe-Barandiaran, A., & Oregui-González, E. (2018). Parental mediation of the Internet use of primary students: Beliefs, strategies and difficulties. [Mediación parental del uso de Internet en el alumnado de Primaria: creencias, estrategias y dificultades]. *Comunicar, 54*, 71-79. https://doi.org/10.3916/c54-2018-07

Berger, P., & Wolling, J. (2019). They need more than technology-equipped schools: Teachers' practice of fostering students' digital protective skills. *Media and Communication, 7*(2), 137-137. https://doi.org/10.17645/mac.v7i2.1902

Brüggemann, M. (2013). *Digitale Medien im Schulalltag: Eine qualitative rekonstruktive Studie zum Medienhandeln und berufsbezogenen Orientierungen von Lehrkräften. [Digital media in the school reality: A qualitative reconstructive study of media management and teachers' professional orientation]*. Kopaed. https://bit.ly/2J4iZGy

Brüggen, N., Dreyer, S., Drosselmeier, M., Gebel, C., Hasebrink, U., & Rechlitz, M. (2017). Jugendmedienschutzindex: Der Umgang mit onlinebezogenen Risiken—Ergebnisse der Befragung von Heranwachsenden und Eltern. [Youth media protection

index: Dealing with online risks—Findings of the survey with youth and parentes]. FSM - Freiwillige Selbstkontrolle Multimedia-Diensteanbieter e.V. http://bit.ly/3b1KCvM

Chen, L., & Shi, J. (2019). Reducing harm from media: A meta-analysis of parental mediation. *Journalism & Mass Communication Quarterly*, *96*(1), 173-193. https://doi.org/10.1177/1077699018754908

Ertmer, P.A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research and Development*, *53*, 25-39. https://doi.org/10.1007/bf02504683

Ferrari, A. (2013). *DIGCOMP: A framework for developing and understanding digital competence in Europe*. Publications Office of the European Union. https://doi.org/10.2788/52966

Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Duckworth, D. (2020). *Preparing for life in a digital world: IEA International computer and information literacy study 2018 international report*. Springer Open. https://doi.org/10.1007/978-3-030-38781-5

Frau-Meigs, D., Velez, I., & Michel, J.F. (2017). *Public policies in media and information literacy in Europe: Cross-country comparisons*. Routledge. https://doi.org/10.4324/9781315628851

Hartai, L. (2014). *EMEDUS - European media literacy education study: Report on formal media education in Europe*. Hungarian Institute for Education Research and Development. http://bit.ly/38UClty

Hatlevik, I.K., & Hatlevik, O.E. (2018). Students' evaluation of digital information: The role teachers play and factors that influence variability in teacher behaviour. *Computers in Human Behavior*, *83*, 56-63. https://doi.org/10.1016/j.chb.2018.01.022

Hobbs, R. (2010). Digital and media literacy: A plan of action. http://bit.ly/2tA8mqD

Jiménez-Iglesias, E., Garmendia-Larrañaga, M., & Casado-Del-Río, M.A. (2015). Percepción de los y las menores de la mediación parental respecto a los riesgos en Internet. *Revista Latina de Comunicación Social*, *70*, 49-68. https://bit.ly/2UdqPEs

Kalmus, V. (2013). Making sense of the social mediation of children's Internet use: Perspectives for interdisciplinary and cross-cultural research. In Wijnen, C.W., Trültzsch, S., & Ortner, C. (Eds.), *Medienwelten im Wandel: Kommunikationswissenschaftliche Positionen, Perspektiven und Konsequenzen. [Media worlds in change: Positions, perspectives and consequences of the Communication Science]* (pp. 137-149). Springer. https://doi.org/10.1007/978-3-531-19049-5_11

Kalmus, V., Von-Feilitzen, C., & Siibak, A. (2012). Effectiveness of teachers' and peers' mediation in supporting opportunities and reducing risks online. *Children, risk and safety on the Internet: Research and policy challenges in comparative perspective*, (pp. 245-256).

Karaseva, A., Siibak, A., & Pruulmann-Vengerfeldt, P. (2015). Relationships between teachers' pedagogical beliefs, subject cultures, and mediation practices of students' use of digital technology. *Cyberpsychology*, *9*(1). https://doi.org/10.5817/cp2015-1-6

Kirwil, L. (2009). Parental mediation of children's Internet use in different European countries. *Journal of Children and Media*, *3*(4), 394-409. https://doi.org/10.1080/17482790903233440

KMK (Ed.) (2012). Medienbildung in der Schule—Beschluss der Kultusministerkonferenz vom 8. März 2012. [Media education at school—Resolution of the Kultusministerkonferenz from 8. March 2012]. http://bit.ly/2Z5l3VX

Knezek, G., & Christensen, R. (2016). Extending the will, skill, tool model of technology integration: Adding pedagogy as a new model construct. *Journal of Computing in Higher Education*, *28*(3), 307-325. https://doi.org/10.1007/s12528-016-9120-2

Lee, S.J. (2013). Parental restrictive mediation of children's Internet use: Effective for what and for whom? *New Media & Society*, *15*(4), 466-481. https://doi.org/10.1177/1461444812452412

Livingstone, S., & Haddon, L. (2009). *EU kids online: Final report*. LSE, EU Kids Online. https://doi.org/10.2307/j.ctt9qgvds

Livingstone, S., Haddon, L., Görzig, A., & Ólafsson, K. (2011). *Risks and safety on the Internet: The perspective of European children. Full findings*. EU Kids Online. http://bit.ly/35Deqwt

Livingstone, S., & Helsper, E.J. (2008). Parental mediation of children's Internet use. *Journal of Broadcasting & Electronic Media*, *52*(4), 581-599. https://doi.org/10.1080/08838150802437396

Livingstone, S., Ólafsson, K., Helsper, E.J., Lupiáñez-Villanueva, F., Veltri, G.A., & Folkvord, F. (2017). Maximizing opportunities and minimizing risks for children online: The role of digital skills in emerging strategies of parental mediation. *Journal of Communication*, *67*(1), 82-105. https://doi.org/10.1111/jcom.12277

Lorenz, R., Endberg, M., & Bos, W. (2019). Predictors of fostering students' computer and information literacy – analysis based on a representative sample of secondary school teachers in Germany. *Education and Information Technologies*, *24*, 911-928. https://doi.org/10.1007/s10639-018-9809-0

Mendoza, K. (2009). Surveying parental mediation: Connections, challenges and questions for media literacy. *Journal of Media Literacy Education*, *1*(1), 28-41. http://bit.ly/2PA5vGF

Nathanson, A.I. (2002). The unintended effects of parental mediation of television on adolescents. *Media Psychology*, *4*(3), 207-230. https://doi.org/10.1207/s1532785xmep0403_01

Nikken, P., & Jansz, J. (2014). Developing scales to measure parental mediation of young children's internet use. *Learning, Media and Technology*, *39*(2), 250-266. https://doi.org/10.1080/17439884.2013.782038

Nikken, P., & Schols, M. (2015). How and why parents guide the media use of young children. *Journal of Child and Family Studies*, *24*(11), 3423-3435. https://doi.org/10.1007/s10826-015-0144-4

Partnership for 21st Century Learning (Ed.) (2015). P21 framework definitions. https://bit.ly/2QAPSik

Petko, D. (2012). Teachers' pedagogical beliefs and their use of digital media in classrooms: Sharpening the focus of the 'will, skill, tool' model and integrating teachers' constructivist orientations. *Computers & Education*, *58*(4), 1351-1359. https://doi.org/10.1016/j.compedu.2011.12.013

Pöttinger, I., & Meister, D.M. (2014). School's out? Informal and formal media education-An international perspective. In *School's out? Informelle und formelle Medienbildung*. Kopaed. http://bit.ly/2Ws1hog

Shin, W., & Lwin, B. (2017). Parental mediation of children's digital technology use in Singapore. *Journal of Children & Media*, *11*(1), 1-19. https://doi.org/10.1080/17482798.2016.1203807

Siddiq, F., Scherer, R., & Tondeur, J. (2016). Teachers' emphasis on developing students' digital information and communication skills (TEDDICS): A new construct in 21st century education. *Computers & Education*, *92-93*, 1-14. https://doi.org/10.1016/j.compedu.2015.10.006

Smahelova, M., Juhová, D., Cermak, I., & Smahel, D. (2017). Mediation of young children's digital technology use: The parents' perspective. *Cyberpsychology*, *11*(3), 11-11. https://doi.org/10.5817/cp2017-3-4

Tejedor, S., & Pulido, C. (2012). Challenges and risks of Internet use by children. How to empower minors? [Retos y riesgos del uso de Internet por parte de los menores. ¿Cómo empoderarlos?]. *Comunicar*, *39*, 65-72. https://doi.org/10.3916/c39-2012-02-06

Thüringer Ministerium für Bildung, Jugend und Sport (Ed.) (2018). Statistisches Informationssystem Bildung: Personal nach Alter und Durschnittsalter. [Statistical education information system: Staff by age and average age]. http://bit.ly/36OmkU1

Trültzsch-Wijnen, C., Murru, M.F., & Papaioannou, T. (2017). Definitions and values of media and information literacy in a historical context. In *Public policies in media and information literacy in Europe: Cross-country comparisons* (pp. 91-115). Routledge. https://doi.org/10.4324/9781315628851-3

UNESCO (Ed.) (2013). Global media and information literacy assessment framework: Country readiness and competencies. http://bit.ly/2PWFal8

Wernstedt, R., & John-Ohnesorg, M. (2008). *Soziale Herkunft entscheidet über Bildungserfolg Konsequenzen aus IGLU 2006 und PISA III. [Social background decides about success in education. Consequences from the IGLU 2006 and the PISA III]*. Friedrich-Ebert-Stiftung. http://bit.ly/2Ss3xKc

Wolling, J., & Berger, P. (2018). *Die Vermittlung von Medienkompetenz in allgemeinbildenden Schulen: Zentrale Ergebnisse eines Evaluationsprojekts. [Fostering media literacy in general education schools: Central results of an evaluation project]*. Ilmenau Universitätsverlag. https://doi.org/10.22032/dbt.34913
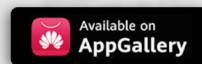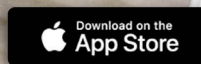
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Bullying and cyberbullying: Variables that influence university dropout
Acoso y ciberacoso: Variables de influencia en el abandono universitario

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ABSTRACT

The increase in dropout rates in higher education is a phenomenon that has generated a lot of interest because of the need to deal with its economic, personal, and social consequences, and because of its prevalence, estimated around 30% in Spain. There is a similar interest in violent behavior in university classrooms, which has also been seen to have increased in recent years. Given that, and the fact that research has shown personal variables to be more influential in dropout from higher education, the aim of this study is to explore whether those students who are the victims of bullying (both traditional and cyberbullying) are closer to dropping out from their degree courses. To that end, 1,653 first-year students doing various degree courses in the north of Spain were asked to complete a questionnaire. The results of a Bayesian analysis showed that students who were victims of bullying were more likely to consider dropping out than students who were not victims of bullying. In addition, variables related to social integration (support from friends and teachers) exhibited a moderating effect. These findings raise the urgent need to include intervention strategies in relation to bullying in university plans to prevent dropout.

RESUMEN

El aumento del abandono en los estudios superiores es un fenómeno que suscita un gran interés por la necesidad de paliar los efectos económicos, personales y sociales que genera; y por su nivel de prevalencia, que informes recientes cifran en España en torno a un 30%. Algo semejante ocurre con los comportamientos violentos en las aulas universitarias, cuyo incremento se ha constatado en los últimos tiempos. Teniendo esto en cuenta, y dado que tal y como pone de manifiesto la investigación científica son las variables personales las que parecen ejercer un mayor peso en el abandono de los estudios superiores, el objetivo que este trabajo persigue es investigar si aquellos universitarios que están siendo víctimas de acoso (acoso tradicional y ciberacoso) pueden tener un mayor planteamiento de abandono de la titulación. Para ello, se implementó un cuestionario a 1.653 estudiantes de primer curso de varias titulaciones de una universidad del norte de España. Los resultados del análisis bayesiano realizado muestran que aquellos estudiantes que son víctimas de acoso, en comparación con aquellos que no lo son, se plantean abandonar sus estudios en mayor medida, teniendo además las variables relacionadas con la integración social (apoyo de amigos y profesores) un efecto moderador. Estos hallazgos plantean la urgente necesidad de incluir estrategias de intervención sobre el acoso en los planes de prevención del abandono universitario.

KEYWORDS | PALABRAS CLAVE

Higher education, university students, intention to drop out, persistence, violence, bullying, cyberbullying, social integration.
Educación superior, estudiantes universitarios, intención de abandono, permanencia, violencia, acoso, ciberacoso, integración social.

1. Introduction

Nowadays, one of the main problems affecting higher education is university students dropping out, which is not only a national concern, but also a concern within the European Union and internationally (González-Ramírez & Pedraza-Navarro, 2017; Tuero et al., 2018). However, defining university dropout is not simple. As Aina (2013) and Heublein (2014) showed, it may refer to various different events such as changing courses or changing universities. Whatever the type of event, the dropout process is usually operationalized by confirming that the students are no longer signed up to their original course for two years after the last time they registered (Gury, 2011).

The most recent report from the Spanish Ministry of Science, Innovation, and Universities (2019), about the 2014/15 university cohort, showed that 21.5% of the Spanish students who registered for the first year of a university course definitively dropped out, whereas 8.2% changed course, giving an overall dropout rate of 29.7%. Given the scale of this dropout rate, it is no surprise that over recent years many studies have been conducted aimed at determining the most important variables in this event, as well as at assessing the extent of their influence on the final decision (Duque, 2014; Roso-Bas et al., 2016; Sosu & Pheunpha, 2019; Vergara et al., 2017). For one of the foremost experts on the subject, Tinto (1975), university dropout may be produced by a combination of causes that interact with each other, with key relationships being between academic integration, social integration, and institutional commitment. Other more recent studies have also shown an interest in determining which the variables that allow students to persist in their studies are (Strom & Savage, 2014; Suhlmann et al., 2018; Vázquez-Alonso & Manassero-Mas, 2016), assuming continuing at university to be the opposite phenomenon to dropping out. In this regard, the particularly important factors were found to be students' academic careers (Casanova et al., 2018), in which the variables that operate from a personal perspective are significant. In addition, social integration variables have been found to be important, based on relationships with teachers and classmates (Esteban et al., 2016; Mendoza et al., 2014).

As one might appreciate, working from a holistic, comprehensive perspective means that the causes of dropout in higher education are so broad and varied that its different dimensions make it difficult to approach it as a single entity. Aware of this, some more contemporary studies have underscored the need to continue addressing the issue, placing all their emphasis on the student and on the variables that bridge the personal and the social, as well as affective-motivational variables (Álvarez-Pérez & López-Aguilar, 2017; Broc, 2011). One variable of this type is the students' experience of episodes of bullying, something which can lead to academic absences, lack of social integration, and poor performance among other things (García & Ascensio, 2015). It can also be somewhat related to the decision to drop out of higher education, particularly considering recent studies demonstrating the relationship between dropout and missing classes (Aguado, 2017; Cox, 2016), poor performance (Da-Re et al., 2015; Garzón & Gil-Flores, 2017), and a lack of integration in the class-group (González-Ramírez & Pedraza-Navarro, 2017; Vergara et al., 2017).

Furthermore, the increase in bullying cases in recent years (both traditional and cyberbullying) has heightened interest in this problem in the area of higher education (Álvarez-García et al., 2017; Prieto et al., 2015), even more so if one considers the prevalence, which ranges from 20% to 50% of university students (Vergel et al., 2016), and the academic, social, and personal impact it can have (Tippett & Wolke, 2014). There is a wide range of negative personal repercussions, in particular suffering feelings of unhappiness (Nansel et al., 2004), developing anxiety (Reijntjes et al., 2010) and depression (Zwierzynska et al., 2013), feelings of loneliness, isolation, and poor social skills (Veenstra et al., 2005), and even triggering a tendency to self-harm or suicidal ideations (Winsper et al., 2012). Based on that, the main objective of the current study was to examine the relationship between the existence of bullying (traditional and cyberbullying) at university and the intention to drop out, and to assess the role that might be played by having satisfactory relationships with teachers, classmates, and friends.

2. Methodology

2.1. Participants

The participating sample was made up of 1,653 students from the University of Oviedo aged between 17 and 48 years old (M=19.4; SD=3.4). Most were women (75.5%) rather than men (24.5%). This

imbalance is due to the nature of the student populations on the courses examined in our study, which exhibit these differences in students by sex. Almost a third (62.2%) of the students were studying courses within social sciences (degrees in infant education and primary education) whereas 35.3% were doing courses in health sciences (degrees in psychology, nursing, and speech therapy), and 2.5% were doing degrees in arts and humanities (degrees in philosophy).

2.2. Instrument

In order to collect information for the study we used the University Violence Questionnaire (UVQ), created ad hoc using current theoretical models and empirical evidence, and in part based on two questionnaires that have been used previously with good results (Dobarro et al., 2018), although they were more focused on cyberbullying. Both of those questionnaires were aimed at students; the first took the victim's perspective (University Online Victimization Questionnaire) and the second used an observer's perspective (Observed University Online Victimization Questionnaire). The University Online Victimization Questionnaire from Dobarro et al. (2018) has 21 items which ask the student about various types of aggression they might experience via mobile phones or the internet. The design of this questionnaire refers to Nocentini's theoretical model (Nocentini et al., 2010). In the questionnaire, the students are asked to indicate how often they have been victims of bullying in the previous year in each of the situations described, they respond using a Likert-type scale with four response alternatives (1=never, 2=occasionally, 3=almost always, and 4=always). Examples of the items include: "a classmate has posted compromising photos of mine online without my permission in order to make fun of me or hurt me", "I have received insults from classmates, or been made fun of, in private, via email, social networks, or instant messaging services (Snapchat, Facebook, Instagram, etc.)", "Some classmates have conspired to send me to Coventry (give me the silent treatment) in class", and "I have felt ignored or excluded in the class group or in the university because of my sexual orientation or identity".

The Observed University Online Victimization Questionnaire (Dobarro et al., 2018) has 26 items, each of which identify possible aggressions via mobile phones or the internet as above. However, in this case the student is asked to indicate how often they have seen these situations in the previous year. The response is given on a Likert-type scale with four response alternatives (1=never, 2=occasionally, 3=almost always, and 4=always). Examples of the items include "some students give other students nicknames in order to ridicule them", "some students make fun of their classmates for their sexual orientation or identity", "students manipulate photographs and videos of their classmates and post them online in order to make fun of them or hurt them", and "students video or photograph other people in sexually suggestive poses without their consent".

In addition to the items taken from these two questionnaires, we added a block of personal and sociodemographic questions, along with a set of items specifically related to more traditional bullying, dropping out, and social integration. To measure the final two areas, the intention to drop out, and the establishment of relationships that could be a support for the student or not, we took four items from the study by Bernardo et al. (2018). Although those items in the test used a 4-point Likert-type scale going from 1=completely disagree to 4=completely agree, in the final analysis we recoded the responses as 1=yes, 2=no, to simplify the results and make them easier to interpret. The final questionnaire (University Violence Questionnaire) is a self-report with a total of 71 items collecting sociodemographic information, information about the intention to drop out, relationships which could be support for the student, and information about the frequency of both traditional and cyber-bullying behavior between university students (Bernardo et al., 2018; Dobarro et al., 2018). We confirmed the soundness of the instrument from the results of an exploratory factor analysis (using the principal components method and direct Oblimin rotation) which validated the test structure (KMO=.837, Barlett p=.000), explaining 48.65% of the variance, and also by the results of the reliability analysis (Cronbach alpha=.897).

2.3. Procedure

Before administering the instrument, the researchers sent emails to various university institutions requesting their collaboration in the study. We held a series of meetings with professors who had decided

to participate in order to explain the study objectives and present the questionnaire. The questionnaire was applied to groups during class hours in the various degree courses following a date being agreed with the teachers who accepted to participate. The University Violence Questionnaire was administered to students in the first year of various degree courses in different departments in the University of Oviedo during academic years 2016-17 and 2017-18. We sought students' participation in writing, informing them of the nature and objective of the study. The study was carried out in compliance with all of the ethical principles, and guidelines for confidentiality and data protection necessary in this kind of study.

2.4. Data analysis

Data analysis was performed using the SPSS statistics package, version 22.0 for Windows. Firstly, we carried out a descriptive analysis, recoding the intention to drop out variable to a dichotomous variable: the response alternatives 1 and 2 (completely disagree and disagree) were recoded as no intention to drop out, and options 3 and 4 (agree and completely agree) were coded as the intention to drop out. Following that, and in order to examine the effect of being the victim of bullying (either traditional or cyber-bullying) on the decision to drop out, we performed a Bayesian analysis, as the Bayes factor allows comparison of probabilities between the null hypothesis and the alternative in such a way that the closer it is to zero, the better the evidence in favour of the alternative hypothesis (Cleophas & Zwinderman, 2018).

Finally, using contingency tables, we examined the moderating effect of certain variables, such as students getting support from friends and teachers, on being victims of bullying and exhibiting the intention to drop out.

3. Results

We examined the proportion of university students who were victims of bullying (both traditional bullying and online bullying) from their classmates. To calculate that, we took the scores in the University Violence Questionnaire (UVQ) that were in the 75th percentile and above, which included those cases who scored at least one standard deviation above the scale mean. In this regard, it is important to note that other studies into bullying (Álvarez-García et al. 2015; Garaigordobil, 2011) used scores above the 90th percentile (P90) as severe bullying. Our results showed that 17.3% of first-year students had been bullied at university, and 7.8% of students had suffered from severe bullying. Table 1 indicates that 41.9% (N=692) of students had reported considering dropping out at some point, whereas 58.1% (N=961) had never considered it.

Table 1. Descriptive statistics					
	Drop out	N	Mean	Deviation	Mean error
VicScore[a]	=NO	961	21.9126	3.97055	.12808
	=YES	692	26.1358	5.13455	.19519

a. VicScore: Victim score, the total of all items related to being a victim of bullying.

We continued the analysis by examining the relationship between being a victim of bullying and the decision to drop out of higher education. The results of the Bayesian analysis (Table 2) show that victims of bullying were significantly more likely to drop out (Bayes factor .000; p=.000).

Table 2. Independent sample Bayes factor test (Method=Rouder)[a]					
	Difference in means	Bayes factor[b]	t	df	Sig. (bilateral)
VicScore	4.2232	.000	18.847	1651	.000

a. Assuming different variance between groups.
b. Bayes factor: null hypothesis vs. alternative hypothesis.

Table 3 gives the credible intervals at 95%.

Table 3. Characterization of posterior distribution for independent sample mean					
	Posterior			95% credible interval	
	Mode	Mean	Variance	Lower limit	Upper limit
VicSocre	4.2232	4.2232	.055	3,7650	4,6815

a. Prior for variance: Diffuse. Prior for mean: Diffuse.

Following that, we examined the moderating effects of variables such as being able to count on the support of teachers. The results indicated that students who were victims of bullying and who did not have good relationships with teachers were more likely to consider dropping out than those who had not been the victims of bullying (Chi-squared 248.8; p=.000). In this case the effect size was moderate (Cramer's V=.525). In addition, the contingency table (Table 4) shows that being the victim of bullying and not having the support of teachers increased the likelihood (64.9%) of considering dropping out of the course.

Table 4. Relationship between being a victim of bullying, considering dropping out, and support from teachers (N=1653)					
Relationship with teachers			**Intention to drop out**		
			NO	**YES**	**Total**
No close relationship	Not a victim of bullying	Recount	460	142	602
		% within VICTIM	76.4%	23.6%	100.0%
	Victim of bullying	Recount	52	96	148
		% within VICTIM	35.1%	64.9%	100.0%
Close relationship	Not a victim of bullying	Recount	402	178	580
		% within VICTIM	69.3%	30.7%	100.0%
	Victim of bullying	Recount	47	276	323
		% within VICTIM	14.6%	85.4%	100.0%

We found a similar occurrence with support received from student groups (Chi-squared=122.8; p=.000; Cramer's V =.480). As Table 5 shows, the perception of lacking that support increased the likelihood of dropout in students who were victims of bullying (80.6%) compared to those who were not (28.2%).

Table 5. Relationship between being a victim of bullying, considering dropping out, and support from student groups (N=1653)					
Support from student groups			**Intention to drop out**		
			NO	**YES**	**Total**
No support	Not a victim of bullying	Recount	582	229	811
		% within VICTIM	71.8%	28.2%	100.0%
	Victim of bullying	Recount	60	250	310
		% within VICTIM	19.4%	80.6%	100.0%
Support	Not a victim of bullying	Recount	280	91	371
		% within VICTIM	75.5%	24.5%	100.0%
	Victim of bullying	Recount	39	122	161
		% within VICTIM	24.2%	75.8%	100.0%

We also examined the effect of support from friends (Chi-squared=246.5; p=.000; Cramer's =.458), although the effect size was smaller. Not having support from friends at university increases the likelihood that victims of bullying consider dropping out (see Table 6).

Table 6. Relationship between being a victim of bullying, considering dropping out, and support received from friends at university (N= 1653)					
Friends' support			**Intention to drop out**		
			NO	**YES**	**Total**
Without the support of good friends	Not a victim of bullying	Recount	75	148	223
		% within VICTIM	33.6%	66.4%	100.0%
	Victim of bullying	Recount	36	219	255
		% within VICTIM	14.1%	85.9%	100.0%
With the support of good friends	Not a victim of bullying	Recount	787	172	959
		% within VICTIM	82.1%	17.9%	100.0%
	Victim of bullying	Recount	63	153	216
		% within VICTIM	29.2%	70.8%	100.0%

4. Discussion

The main aim of this study was to examine the relationship between bullying at university and students' intentions to drop out of their courses. In order to do that, we began by examining the prevalence of (traditional and online) bullying in the higher education context. As expected, and despite bullying being a topic that has been studied principally in compulsory education, peer bullying is also relatively common at university. In fact, our study confirmed a prevalence (for both traditional and online bullying) of 18%. Studies such as Marraccini et al. (2018) have demonstrated similar results, finding a rate of bullying of 22% in their sample, while other authors have put the rate of cyberbullying in Spanish universities above 50%, similar to data from the USA (Yubero et al., 2017). Perhaps these not insignificant numbers are due to young people bringing this behavior with them from secondary education, or maybe because universities have few assessments or mechanisms for these kinds of problems, which helps them embed when they do occur or become established over the course of the university phase of education.

If we turn to the principal objective of the study, the analysis of the relationship between bullying and the intention to drop out in university students, the results confirm that suffering from bullying (both traditional and online bullying) is an influential variable that increases the likelihood that young people would consider dropping out of their higher education courses. These results are in line with findings from other authors which range from correlations that are weak but significant (Dobarro et al., 2017), to strongly supported correlations (Alban & Mauricio, 2019). In this regard, it is also important to consider the transition period, students moving from secondary to higher education. It is a time when there are changes of surroundings, differences in how teaching is organized and how evaluations are carried out, more variable processes of communication with teachers, and disconnection from prior habitual friendship groups, meaning people have to look for new relationships with their classmates. All of these may lead students to feel less support and be at greater risk of dropping out (Feixás et al., 2015; Figuera & Álvarez, 2014).

The support provided by appropriate social integration among peers has been shown to be a protective factor for adolescents' development and wellbeing (Estévez et al., 2009; Rueger et al., 2010). This is something which, in addition to being confirmed in our study, has been seen in research by Cava et al. (2010) and Cava (2011). The conclusion from this is that the students who are more vulnerable to bullying by their classmates are those who are more socially isolated. In line with that, the results of our study show that there is an inverse relationship between being a victim of bullying and the support that students get from their friends and teachers. Similar to the intention to drop out, those who reported the highest ratings in their relationships with classmates (Arriaga et al., 2011) and with teachers (Bernardo et al., 2016) were the least likely to consider dropping out.

In this regard, and as noted by Luengo (2017), intervention models based on peer mediation (Villanueva et al., 2013), integrated models to improve coexistence (Torrego, 2006; 2008; Torrego & Martínez, 2014), cooperative learning (León et al. 2016), and support teams (Avilés & Alonso, 2011), among others, indicate the importance of receiving support from classmates in the prevention of bullying. These types of initiatives are relatively widespread in pre-university education but not in higher education. Given that being the victim of bullying has been shown to be a risk variable for course dropout, maybe it should also be considered when designing approaches to prevent or stop bullying (both traditional and online) in the university setting.

5. Conclusions

For many years, some authors questioned the existence of bullying behavior in the university context, ascribing it mainly to the previous educational stages. Our study confirms the existence of this kind of behavior in the university environment, with a prevalence of almost 18%, which is almost within the usual range (20% to 50%) found in the few previous studies that have been carried out (Vergel et al., 2016).

Our study went beyond that, however, and looked at the relationship between being a victim of bullying in the higher education environment and the intention to drop out of the course. The results were conclusive in showing that relationship and demonstrating how the negative impact of bullying (both traditional and online) can trigger dropout from university. We also examined the moderating effect on

that relationship of variables such as support from teachers and friends. We found that they can act as protective factors against considering dropping out. Therefore, these results demonstrate the urgent need to include different intervention strategies against bullying in university plans to prevent dropout.

Despite the important findings from our study, we must highlight the limitation of analyzing the data via exploratory factor analysis. Because of that, and with an eye to future research, it would be interesting to carry out a confirmatory factor analysis using a larger sample, as well as differentiating between traditional and online bullying now that our study has confirmed the presence of both types of bullying and their influence on the intention to drop out of the course.

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References

Aguado, J.C. (2017). Can MOOCs promote learning by reducing university dropout rates? *Revista Iberoamericana de Educación a Distancia*, *20*, 125-143. https://doi.org/10.5944/ried.20.1.16684

Aina, C. (2013). Parental background and university dropout in Italy. *Higher Education*, *65*, 437-456. https://doi.org/10.1007/s10734-012-9554-z

Alban, M., & Mauricio, D. (2018). Factors that influence undergraduate university desertion according to students perspective. *International Journal of Engineering and Technology*, *10*(6), 1585-1602. https://doi.org/10.21817/ijet/2018/v10i6/181006017

Álvarez García, D., Barreiro-Collazo, A., & Núñez, J.C. (2017). Civeraggression among adolescents: Prevalence and gender differences. [Ciberagresión entre adolescentes: prevalencia y diferencias de género]. *Comunicar*, *50*, 89-97. https://doi.org/10.3916/c50-2017-08

Álvarez García, D., Pérez, J.C.N., González, A.D., & Pérez, C.R. (2015). Risk factors associated with cybervictimization in adolescence. *International Journal of Clinical and Health Psychology*, *15*(3), 226-235. https://doi.org/10.1016/j.ijchp.2015.03.002

Álvarez Pérez, P.R., & López-Aguilar, D. (2017). Estudios sobre deserción académica y medidas orientadoras de prevención en la Universidad de La Laguna (España). *Paradigma*, *38*, 48-71. https://bit.ly/3bsthMQ

Arriaga, J., Burillo, V., Carpeño, A., & Casaravilla, A. (2011). *Caracterización de los tipos de abandono. Dividamos el problema y venceremos fácilmente*. Nicaragua.

Avilés, J.M., & Alonso, N. (2011). El papel de los equipos de ayuda en la convivencia escolar y en la lucha contra el bullying. *Revista Amazõnica*, *6*(1), 133-141. https://bit.ly/2QHxZi2

Bernardo, A., Cervero, A., Esteban, M., Fernández, A., Solano, P., & Agulló, E. (2018). Variables related to the university dropout intention during the transition period. *Revista d'Innovació Docent Universitària*, *10*, 122-130. https://doi.org/10.1344/RIDU2018.10.11

Bernardo, A., Cervero, A., Esteban, M., Fernández, E., & Núñez, J.C. (2016). Influencia de variables relacionales y de integración social en la decisión de abandonar los estudios universitarios en educación superior. *Psicologia, Educação e Cultura*, *20*, 138-151. https://bit.ly/2QDTgJk

Broc, M.A. (2011). Motivation to study, effort management, efficient time management, and academic performance of university students. *Revista de Investigación Educativa*, *29*(1), 171-185. https://doi.org/10.15581/004.28.117-138

Casanova, J.R., Cervero, A., Núñez, J.C., Almeida, L.S., & Bernardo, A. (2018). Factors that determine the persistence and dropout of university students. *Psicothema*, *30*(4), 408-414. https://doi.org/10.7334/psicothema2018.155

Cava, M.J. (2011). Family, teachers, and peers: Keys for ssuporting victims of bullying. *Psychosocial Intervention*, *20*(2), 183-192. https://doi.org/10.5093/in2011v20n2a6

Cava, M.J., Buelga, S., Musitu, G., & Murgui, S. (2010). School violence between adolescents and their implications in the psychosocial adjustment: A longitudinal study. *Revista de Psicodidáctica*, *15*(1), 21-34. https://bit.ly/2JcysEs

Cleophas, T.J., & Zwinderman, A.H. (2018). *Modern bayesian statistics in clinical research*. Springer. https://doi.org/10.1007/978-3-319-92747-3

Condom, M.F., Moreno, J.L.M., Sallán, J.G., Rodríguez-Gómez, D., & Casanoves, M.N. (2015). Towards a comprehension of university dropout in Catalonia: The case of Universitat Autonoma de Barcelona. *Estudios sobre Educación*, *28*, 117-138. https://doi.org/10.15581/004.28.117-138

Cox, L. (2016). Student absence in university halls. *Contextos*, *35*, 69-80. https://bit.ly/3bnt9OT

Da-Re, L., Álvarez Pérez, P., & Clerici, R. (2015). Adaptación al contexto universitario italiano del modelo de tutoría formativa para la prevención del abandono y la mejora del rendimiento académico. In *Investigar con y para la sociedad* (pp. 721-730). Bubok.

De-Vries, W., León, P., Romero, J.F., & Hernández, I. (2011). ¿Desertores o decepcionados? Distintas causas para abandonar los estudios universitarios. *Revista de la Educación Superior*, *40*(160), 29-49. https://bit.ly/33ES7q3

del Barco, B.L., del Río, M.I.P., Delgado, M.G., & Lázaro, S.M. (2015). Relevancia del aprendizaje cooperativo sobre los diferentes perfiles de la dinámica bullying. Un análisis mediante pruebas de tamaño del efecto. *Anales de Psicología*, *32*(1), 80-80. https://doi.org/10.6018/analesps.32.1.183141

Dobarro, A., Carbajal, R., Ayala, I., Herrero, F.J., & Bernardo, A. (2017). Ciberbullying and violence at university, how does it affect dropout? *Revista de Estudios e Investigación en Psicología y Educación*, *14*, 182-185. https://doi.org/10.17979/reipe.2017.0.14.2737

Dobarro, A., Tuero, E., Bernardo, A., Herrero, F.J., & Álvarez García, D. (2018). An innovative study on ciberbullying in university students. *Revista d'Innovació Docent Universitària*, *10*, 131-142. https://doi.org/10.1344/RIDU2018.10.12

Duque, L.C. (2014). A framework for analysing higher education performance: Students' satisfaction, perceived learning outcomes, and dropout intentions. *Total Quality Management & Business Excellence*, *25*(1-2), 1-21. https://doi.org/10.1080/14783363.2013.807677

Estévez, E., Emler, N., & Wood, C. (2009). Violent offending: An analysis of family, school and community risk factors. In Sahin, O., & Maier, J. (Eds.), *Delinquency: Causes, reduction and prevention* (pp. 275-324). Nova Sciences.

Figuera, P., & Álvarez, M. (2014). Guidance and tutorial intervention in adaptation and persistence of students in university. *Revista de Orientación Educacional*, *28*(54), 31-49. https://bit.ly/3bijLf7

Garaigordobil, M. (2011). Prevalencia y consecuencias del cyberbullying: Una revisión. *International Journal of Psychology and Psychological Therapy*, *11*(2), 233-254. https://bit.ly/2UuDVvN

García, M.E., Gutiérrez, A.B.B., & Rodríguez-Muñiz, L.J. (2016). Persistence in university studies: The importance of a good start. *Aula Abierta*, *44*(01), 1-1. https://doi.org/10.17811/rifie.44.2016.1-6

García, M.V., & Ascensio, C.A. (2015). Bullying y violencia escolar: Diferencias, similitudes, actores, consecuencias y origen. *Revista Intercontinental de Psicología y Educación*, *17*(2), 9-38. https://bit.ly/3dqeJ20

Garzón, A., & Gil-Flores, J. (2017). The role of academic procrastination as factor of university abandonment. *Revista Complutense de Educación*, *28*(1), 307-324. https://doi.org/10.5209/rev_RCED.2017.v28.n1.49682

González-Ramírez, T., & Pedraza-Navarro, I. (2017). Social and families' variables associated with university drop-out. *Educatio Siglo XXI*, *35*(2), 365-388. https://doi.org/10.6018/j/298651

Gury, N. (2011). Dropping out of higher education in France: A micro-economic approach using survival analysis. *Education Economics*, *19*(1), 51-64. https://doi.org/10.1080/09645290902796357

Heublein, U. (2014). Student Drop-out from German higher education institutions. *European Journal of Education*, *49*(4), 497-513. https://doi.org/10.1111/ejed.12097

Luengo, J.A. (2017). Promover la convivencia en los centros educativos: El protagonismo del alumno. *Revista de Estudios de Juventud*, *115*, 97-114. https://bit.ly/3dt6UZN

Marraccini, M.E., Brick, L.A.D., & Weyandt, L.L. (2018). Instructor and peer bullying in college students: Distinct typologies based on latent class analysis. *Journal of American College Health*, *66*(8), 799-808. https://doi.org/10.1080/07448481.2018.1454926

Mendoza, L., Mendoza, U., & Romero, D. (2014). Academic tenure: A concern of the institutions of higher education. *Escenarios*, *12*(2), 130-137. https://doi.org/10.15665/esc.v12i2.320

Ministerio de Ciencia, Innovación y Universidades (Ed.) (2018). *Datos y cifras del Sistema Universitario Español*. Ministerio de Ciencia, Innovación y Universidades. https://bit.ly/2ULtC6J

Nansel, T.R., Craig, W., Overpeck, M.D., Saluja, G., & Ruan, W.J. (2004). Cross-national consistency in the relationship between bullying behaviors and psychosocial adjustment. *Archives of Pediatrics & Adolescent Medicine*, *158*(8), 730-730. https://doi.org/10.1001/archpedi.158.8.730

Nocentini, A., Calmaestra, J., Schultze-Krumbholz, A., Scheithauer, H., Ortega, R., & Menesini, E. (2010). Cyberbullying: Labels, behaviours and definition in three European countries. *Australian Journal of Guidance and Counselling*, *20*(2), 129-142. https://doi.org/10.1375/ajgc.20.2.129

Prieto, M.T., Carrillo, J.C., & Lucio, L.A. (2015). Virtual violence and bullying among university students: The dark side of social networks. *Innovación Educativa*, *15*(68), 33-47. https://bit.ly/2JaQZ45

Reijntjes, A., Kamphuis, J.H., Prinzie, P., & Telch, M.J. (2010). Peer victimization and internalizing problems in children: A meta-analysis of longitudinal studies. *Child Abuse & Neglect*, *34*(4), 244-252. https://doi.org/10.1016/j.chiabu.2009.07.009

Roso-Bas, F., Jiménez, A.P., & García-Buades, E. (2016). Emotional variables, dropout and academic performance in Spanish nursing students. *Nurse Education Today*, *37*, 53-58. https://doi.org/10.1016/j.nedt.2015.11.021

Rueger, S.Y., Malecki, C.K., & Demaray, M.K. (2010). Relationship between multiple sources of perceived social support and psychological and academic adjustment in early adolescence: Comparisons across gender. *Journal of Youth and Adolescence*, *39*(1), 47-61. https://doi.org/10.1007/s10964-008-9368-6

Sosu, E.M., & Pheunpha, P. (2019). Trajectory of university dropout: Investigating the cumulative effect of academic vulnerability and proximity to family support. *Frontiers in Education*, *4*(6), 1-10. https://doi.org/10.3389/feduc.2019.00006

Strom, R., & Savage, M. (2014). Assessing the relationships between perceived support from close others, goal commitment, and persistence decisions at the College Level. *Journal of College Student Development*, *55*(6), 531-547. https://doi.org/10.1353/csd.2014.0064

Suhlmann, M., Sassenberg, K., Nagengast, B., & Trautwein, U. (2018). Belonging mediates effects of student-university fit on well-being, motivation, and dropout intention. *Social Psychology*, *49*(1), 16-28. https://doi.org/10.1027/1864-9335/a000325

Tinto, V. (1975). Dropout from Higher Education: A theoretical synthesis of recent research. *Review of Educational Research*, *45*(1), 89-125. https://doi.org/10.3102/00346543045001089

Tippett, N., & Wolke, D. (2014). Socioeconomic Status and Bullying: A Meta-Analysis. *American Journal of Public Health*, *104*(6), e48-e59. https://doi.org/10.2105/ajph.2014.301960, https://dx.doi.org/10.2105/ajph.2014.301960

Torrego, J.C. (2006). *Modelo integrado de mejora de la convivencia: Estrategias de mediación y tratamiento de conflictos*. Graó. https://bit.ly/2UhIOtf

Torrego, J.C. (2008). *El plan de convivencia. Fundamentos y recursos para su elaboración y desarrollo*. Alianza. https://bit.ly/2vKjFOj

Torrego, J.C., & Martínez, C. (2014). Keys for development of a plan for living together with harmony in schools, from an integral intervention framework. *Qualitative Research in Education*, *3*(1), 83-113. https://doi.org/10.4471/qre.2014.37

Tuero, E., Cervero, A., Esteban, M., & Bernardo, A. (2018). Why do university students drop out? Influencing variables regarding the appproach and consolidation of drop out. *Educación XX1*, *21*(2), 131-154. https://doi.org/10.5944/educxx1.20066

Vázquez-Alonso, A., & Manassero-Mas, M.A. (2016). The voice of first-year students from six countries: Evaluation of their experiences in higher scientific and engineering studies. *Ciência & Educação*, *22*(2), 391-411. https://doi.org/10.1590/1516-731320160020008

Veenstra, R., Lindenberg, S., Oldehinkel, A.J., Winter, A.F.D., Verhulst, F.C., & Ormel, J. (2005). Bullying and victimization in elementary schools: A comparison of bullies, victims, bully/victims, and uninvolved preadolescents. *Developmental Psychology*, *41*(4), 672-682. https://doi.org/10.1037/0012-1649.41.4.672

Vergara, J.R., Boj, E., Barriga, O.A., & Díaz-Larenas, C. (2017). Explanatory factors the student teachers drop-out rates. *Revista Complutense de Educación*, *28*(2). https://doi.org/10.5209/rev_RCED.2017.v28.n2.50009

Vergel, M., Martínez, J., & Zafra, S. (2016). Factors associated with bullying in higher education institutions. *Revista Criminalidad*, *58*(2), 197-208. https://bit.ly/2UaMBsc

Villanueva, L., Usó, I., & Adrián, J.E. (2013). Los programas de mediación entre iguales: Una herramienta eficaz para la convivencia escolar. *Apuntes de Psicología*, *31*(2), 165-171. https://bit.ly/2WG1Bjt

Winsper, C., Lereya, T., Zanarini, M., & Wolke, D. (2012). Involvement in bullying and suicide-related behavior at 11 years: A prospective birth cohort study. *Journal of the American Academy of Child & Adolescent Psychiatry*, *51*(3), 271-282. https://doi.org/10.1016/j.jaac.2012.01.001

Yubero, S., Navarro, R., Elche, M., Larrañaga, E., & Ovejero, A. (2017). Cyberbullying victimization in higher education: An exploratory analysis of its association with social and emotional factors among Spanish students. *Computers in Human Behavior*, *75*, 439-449. https://doi.org/10.1016/j.chb.2017.05.037

Zwierzynska, K., Wolke, D., & Lereya, T.S. (2013). Peer victimization in childhood and internalizing problems in adolescence: A prospective longitudinal study. *Journal of Abnormal Child Psychology*, *41*(2), 309-323. https://doi.org/10.1007/s10802-012-9678-8

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New genius-entrepreneurs:
Itinerary and trajectories of university
educational excellence

Nuevos genios-emprendedores: Itinerario y trayectorias
de excelencia educativa universitaria

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ABSTRACT

The purpose of the present work is to rethink, in the university context, the concept of genius, related to the high intellectual abilities associated with intelligence; also, to connect the idea of entrepreneurial competences, such as leadership or social commitment. The hypothesis is that a university genius is defined by his high creative abilities and, in particular, entrepreneurial ones. From the methodological point of view, the recommendations of the National Association for Gifted Children were followed, and evidence collection was based on such practices, using the results obtained by two studies: the first one with professors and postgraduate students (from Argentina and Spain, from hard and soft sciences) who responded to a conceptual questionnaire, previously validated, in order to delineate common minimum denominators of geniuses. The other one comes from analyzing the results of an acceleration program of entrepreneurial competence with undergraduate students. Combining both data resulted in the need to think in an educational proposal (itinerary) with trajectories of excellence. One during the Degree level, with pilot training activities (in entrepreneurial competence), experimenting on a small scale; and the other in the Postgraduate level, encouraging them to be architects of their "routes", allowing them to self-employ and to become agents of socio-community change.

RESUMEN

El objetivo del presente trabajo es repensar, en el ámbito de la universidad, el concepto de genio en relación con las altas capacidades asociadas con la inteligencia y vincularlo con las englobadas en la competencia emprendedora, como el liderazgo o el compromiso social. Se fortalece la hipótesis de que un genio universitario es o puede serlo, por sus altas capacidades creativas y, concretamente, emprendedoras. Metodológicamente se siguieron las recomendaciones de la Asociación Norteamericana de Niños con Altas Capacidades, por lo que la recolección de las evidencias se basó en prácticas, utilizando los resultados obtenidos en los dos trabajos de campo realizados: Uno con profesores y alumnos de posgrado (de Argentina y España, de ciencias duras y blandas) que respondieron a un cuestionario conceptual, previamente validado, con el fin de delinear unos mínimos comunes denominadores. El otro estudio consistió en analizar los resultados de la implementación de un programa de aceleración de la competencia emprendedora con estudiantes universitarios de Grado. Del cruce de los datos resultó la necesidad de idear una intervención educativa (itinerario) con trayectorias de excelencia. Una en el Grado, con actuaciones formativas piloto (en la competencia emprendedora), experimentales, a pequeña escala y limitadas en el tiempo; y la otra en el Posgrado, siendo los propios estudiantes los arquitectos de sus «rutas», que a la vez que les permiten autoemplearse, les convierten en agentes de cambio socio-comunitario.

KEYWORDS | PALABRAS CLAVE

Genius, teaching-learning itineraries, university, creativity, talent, high intellectual abilities, social entrepreneurship, educational intervention.
Genios, itinerarios de enseñanza-aprendizaje, universidad, creatividad, talento, capacidades, emprendimiento social, intervención educativa.

1. Introduction

In 2014, the "Scientific Guide to High Capacities" warned us about the need to deeply review all research done on giftedness and high intellectual abilities (HIA) based on some old paradigms. This was linked to a lack of consensus among the scientific community about the definition of HIA, an enormous confusion about related concepts and very few works done by interdisciplinary teams. Furthermore, it seems that geniuses have not been the object of research lately. In light of this overall situation, this work proposes to create a conceptualization of the modern genius that lives in our universities. The idea is to identify them and to contribute to their development if they have already been diagnosed, or to "wake them up" if they have not. Then, these geniuses should be brought to a favorable educational ecosystem which adds to the traditional more or less complex contents about diverse topics, at least two of the fundamental standards identified by the National Association for Gifted Children (2019): the social and the leadership aspects. All of this should be included in, at least, one teaching-learning itinerary (with several trajectories), whose finishing line is entrepreneurship, and in particular, social entrepreneurship.

It is crucial to rethink the concept of genius: What do we know about this topic today? And how has it been approached? Here, an educational (not clinical) perspective and prospective are taken in order to assess the contributions that have been made about HIA, understood for their connection not only to cognitive intelligence, but also to other capacities, such as leadership, social skills and social awareness. It is interesting to think of the teaching-learning trajectories for genius university students who either already know they are geniuses when they get to the university (so-called diagnosed), or find this out when they are offered the chance to become entrepreneurs, as field studies show. This refers to a personal experience around Teacher Innovation Projects (PID, for its Spanish initials) carried out more than 5 years ago first, in the University of Extremadura (UEx), and then, in the University of Valladolid (UVa). The Social Education Undergraduate Program had the goal of building creative communities in the university context as well as around social entrepreneurship projects (Möller-Recondo, 2015). Hence, the situations that were derived went beyond the proposal of having innovative and creative ideas. It was observed that once students participated in a "micro-learning experience", they could respond to the challenges of the Sustainable Development Goals (SDGs), by proposing different entrepreneurial projects.

Two additional situations were observed: on the one hand, students who seemed to respond to standard typologies, according to their IQ and academic performance, were able to better themselves. They could also be recognized by their peers and by an external jury who assessed their SDG proposals as "genius" due to the responses they could give to the challenges introduced. On the other hand, those students who worked on their entrepreneurial competence within the program showed higher engagement, creativity and commitment. At the same time, they discovered that they had unknown capacities, abilities and skills, and sometimes talents. The social aspect and their (exercised and delegated) leadership were definitely decisive all throughout the process.

1.1. Literature review

Students with HIA are intellectually above average, since they process information in a different way, with a high degree of creativity, task engagement and intrinsic motivation for learning. According to Tárraga et al. (2014), this fact entails the need to create a specific educational intervention that values their IQ, creativity and work. In any case, most authors link HIA to intellectual performance (López & Moya, 2011; Sastre-Riba & Castelló-Tarrida, 2017; Sastre-Riba et al., 2018) and identify the need to create a specific learning itinerary for them. López and Moya (2011) state that HIA or giftedness (another related concept) occur when there is a high intellectual performance (first order, IQ>155; and second order, IQ>125), creativity and a clear ease to learn. To them, Martín Gálvez et al. (2000) unite talent that refers rather to specific skills in certain areas or genius, which is one that has exceptional abilities in intelligence and creativity. There are also other concepts, which are, for example, related to age, such as earliness and prodigy. Some other national and international studies could also be reproduced, but they ultimately conclude what is hereby presented in summary. In any case, it is highlighted that one of the most advanced lines with regards to HIA is that of intelligence. This is maybe thanks to Gardner (1993) and his multiple intelligences, an interesting proposal back in his days, which has been reviewed nowadays by its author,

who recognized that he should have talked about capacities. Current research about intelligence and neuroscientific contributions about brain studies are transforming the current concepts and ideas about HIA and about the most appropriate action guidelines, as stressed by a study carried out by the Department of Education of the Basque Country Government (Aretxaga-Bedialauneta, 2013.) Likewise, as Castelló-Tarrida (2001) highlights, "the single and static concept of intelligence has made way to a dynamic concept, which is not considered as a single trait, but as a constellation of irregular capacities which vary over life. The idea of the IQ as a measurement of intelligence, and as an indicator of academic, professional and social success, is open to doubt" (Martínez-i-Torres & Guirado-Serrat, 2012). Intelligence -be it multiple or not- could be another element to consider in the conceptualization of HIA, but not a decisive one. As Royo (Del-Barrio, 2018) stated, some scientific issues have been denied; and there are not seven brains but only one intelligence. Having more capacity for some tasks than for others is quite another thing.

Therefore, this work hereby understands the genius as that person with HIA related to intelligence and learning, skills, talents and creativity (Gardner, 1993; Martín-Gálvez et al., 2000; Torrego-Seijo, 2011), who has not only busted through something meaningful for society, but who can also create something and impact their environment; this is what matters. So, in order to be a genius, there is no need to have a high capacity related to a specific IQ. What currently matters are not what the person needs to have, but what the person can do with what they have. This refers to the creation of new educational paradigms that include teaching trajectories that go beyond the cognitive aspect. This is connected to a new challenge: How can we measure those capacities? Are there instruments available to do this? The National Association for Gifted Children (2019) recommends that evidence collection is based on practices, using the results obtained by students. This is the line the present work intends to follow. Within the scientific literature, there are distinct learning models and proposals. On the one hand, there are proposals for geniuses, and on the other hand for entrepreneurs. However, this work intends to pose a combined formula. Different educational proposals developed for people with HIA were studied (Van-Tassel-Baska, 2015; Olszewski-Kubilius et al., 2015; Sastre-Riba et al., 2018; National Association for Gifted Children, 2019), and in their analysis, two different approaches were identified: there are no multidisciplinary works from the previously articulated perspectives, and there are no specific works related to geniuses focusing more on their social dimension than on the intellectual one.

This work highlights the work of Van-Tassel-Baska (2016) which, even though it is targeted towards primary and secondary school students with HIA, it gives accurate clues on how to deal with the problem. It considers that the fundamental aspects that any program should take into account in order to teach students with HIA should revolve around differentiated practices in all subjects, resources, tools, assessments, etc. The foundation of these programs should be composed of a quality teaching staff whose skills and aptitudes should match the capacities of the students in the best way possible. All that should be promoted by a clear acceleration of the teaching-learning process. In this context, a specific university example could be the "Stanford Education Program for Gifted Youth".

The "mega-model" proposed by Olszewski-Kubilius et al. (2015) identifies capacities, competences, expertise and eminence with an effort/practice which, thanks to the added value of the social aspect, for example, can make the person transcend eminence and become a genius. This trait is reached when, after all, something is made to help solve problems for the general world. On the other hand, the CAITAC model (Constructive, Self-regulated, Interactive and Technological) (Pérez-Sanchez & Beltrán-Llera, 2006) aims at taking advantage of the benefits of ICTs for the teaching of students with HIA. The model emphasizes the fact that these teaching tasks should be shared by several people. Thus, different points of view on the same task or content could help enrich one's own perspective. The authors believe it is critical to understand and apply this learning model for the new geniuses, trying to maximize the potential of technologies on learning.

Some proposals of preferable practices, such as cooperative teaching models (Torrego-Seijo, 2011), or in the university context, those practices contained in the "Radar of educational innovation" and the "Educational Model TEC21" (2017; 2018), are not connected to HIA, but specifically refer to how the future of teaching and education should be in the university context. They also include recommendations of what needs to be done, such as investigating the relationship all this might have with motivation (Sastre-

Riba et al., 2019). Another issue is related to competences. A recent work analyzes the relationship between the "eagerness to achieve" curriculum competence and people with HIA in their incorporation to the work environment. Following the results of a survey completed by students, family members and professors, the generic profile of the talented student was outlined. This talented student would have project-solving skills that would position them preferably in the future labor market (García-Guardia et al., 2019.) This work concludes that paying attention to the differential qualities and aptitudes of students with HIA is crucial to implement an individual treatment, by building the adequate contexts for the development and strengthening of their skills.

On the other hand, none of the analyzed works mention entrepreneurship and its corresponding competence in terms of something to be taught to geniuses. They fail to mention any of their associated concepts, such as gifted, talented, eminent or intelligent. This may be because the competence related to entrepreneurship is more connected to the economic market, which does not consider archetypes, stereotypes or people's profiles as much as it considers company results that are measurable in money and success. In this context, a genius would be that person who can, for example, build a unicorn company (Faverón-Patriau, 2018). In short, for people with HIA (emphasizing intellectual ability) individual treatments and cognitive enhancement are recommended, but no thought has been given to entrepreneurial contexts that combine the individual, of course, with integration into society.

Therefore, this work proposes the following: 1) To conceive the genius from a new perspective: one that does not redirect to a static measurement index which refers to one or more profiles connected to traditional HIA and their related concepts (Sastre-Riba & Castelló-Tarrida, 2017); 2) To depart from the statement which considers that every student is a potential genius; in order 3) To create an educational intervention proposal from the development of curriculum models with differentiated trajectories, based on learning and entrepreneurial practices; and 4) To help identify geniuses, as defined by their social contributions rather than by psychological measurements of profiled capacities. In summary, the aim is to identify genius university students who have been "raised" in teaching-learning ecosystems and who became geniuses thanks to what they were able to create, instead of to the traits they were born with. When these traits are measured, they result in a kind of bidi code that simply returns those people to society as geniuses, confronting them with a twofold problem. If they are standardized, they are limited; but, if their obvious differences are ignored, they are incapacitated. That is why, it is important to appeal to a methodology that gathers evidence based on practices and on the results achieved by the students.

2. Materials and methods

Following the recommendations of the "Pre-K to Grade 12 Gifted Programming Standards" (2019), evidence for this work has been based on the implementation of practices (Field Work: FW1 and 2) and on the assessment of results obtained by university students in entrepreneurial competence working scenarios. A conceptual and reflective survey was used. First, it was used to identify the minimum common denominators (MCD) of the concept of (modern) genius and their reality. And then, it was used to validate the hypothesis that considers that HIA should not only refer to cognition and intelligence, but rather the concept should either be broadened or reviewed, paying attention to other standards recommended.

2.1. Participants

Two samples were used, each belonging to a different field work (1 and 2), which converge at the end of this presentation. A sample of 200 people was designed (FW1), all connected to the work groups of two Spanish universities and one Argentinean university, with postgraduate students and professors. The main premise was that all people selected should belong to the so-called soft or hard sciences. This sample is geographically diverse (different provinces from Spain and Argentina), multidisciplinary (it is divided among Humanities, Sciences and Engineering -to use a common area name) and multilevel, without gender or age difference.

On the other hand, a sample applied to another field work (FW2) was collected. It was composed of 150 undergraduate students who participated in four university PIDs (throughout five years and in two different universities) aiming at building creative communities around social entrepreneurship projects.

The n=150 sample refers to the participants of an entrepreneurial competence development and micro-acceleration program which ended with the creation of social entrepreneurship proposals around the challenges posed by the SDGs.

2.2. Instruments

In order to be able to systematically address the creation of a comprehensive teaching assistance program for geniuses (i.e. to prepare a containment ecosystem) it is necessary to identify who those geniuses are, or could be, within the university, in today's educational context. Ultimately, this tool is the assessment instrument used throughout the proposal. Within the framework of FW1, a survey was built around two broad segments: the first referred to the conceptualization of what a genius is, and the second asked for examples. Moreover, an assessment rubric was provided to examine the entrepreneurial competence of those who completed the survey (the so-called background knowledge about the topic). All surveys were completed, and results were shared, using "Google Forms" templates that were later saved in the cloud in order to show the obtained results simply and clearly. As regards FW2 (that refers to micro-teaching and the results obtained by students), the instruments used were related to the agile methodologies needed to become an entrepreneur: Design Thinking, Project-based Learning, Challenge-based Learning, Events-based Learning and Workshop.

Finally, with all the data gathered and the philosophy applied to its analysis, it was clear that results needed to be assessed. From, and with those results, an educational intervention, broader than the ones used in FW2 (small-scale, time-limited pilot experimental actions), needed to be created. This proposal should result in the creation of an itinerary containing excellence trajectories with a high degree of customization, it should consider differentiation, without knowledge and practices integration. This itinerary should also let every individual shape their own learning and entrepreneurship path, and in that journey, be able to discover or rediscover (as appropriate) the genius that everyone has or may have inside.

3. Analysis and results

3.1. Determination of a genius' outstanding skills

Based on the data derived from the second segment of the FW1 survey, with the examples of geniuses, a chart (Figure 1) was made, in which Einstein prevailed as prototypical.

Figure 1. Examples of geniuses
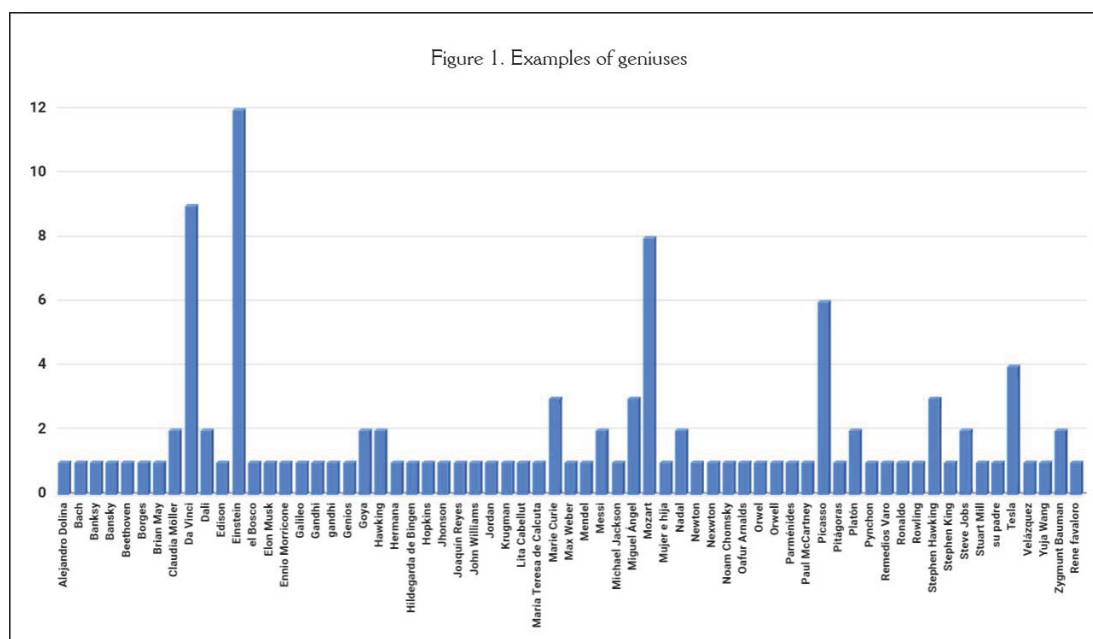
As it could be observed, nowadays, there is no discussion about the modern concept of genius. This is partly shown in this prototypical prevalence, which accepts the historical, traditional meaning, and considers IQ as a decisive aspect of HIA, and thus of what a genius is. In any case, the answers given strengthen the hypothesis that a genius also has other HIA, where the social aspect plays a significant role. This is perfectly shown in the examples provided.

In turn, Figure 2 shows the results obtained from the first segment of the survey, which suggested that respondents provided a definition of a genius in order to identify the MCDs. According to the respondents, a genius was a puzzle made up of, in order of importance, creativity and HIA (among which the skills in a particular subject, i.e. traditional intelligence, -or the IQ- were highlighted.) Resolution and working capacity were considered less important, but were selected. Lastly, vision and ability, focus, curiosity and innovation appeared.

With the data obtained, this work does not intend to outline geniuses' profiles or taxonomies. As the scientific literature highlights, every case is unique, and it is not easy to classify a genius within one or more behavioral models. In fact, the challenge was to build, at least, one itinerary with several trajectories, where results allowed us to think and build as many behavioral models as geniuses and social projects existed. Actually, the intention was to find the puzzle parts to configure the genius, but not to diagnose them. The idea was to use those parts to value and assess teaching proposals in the university context.

Figure 2. The geniuses puzzle
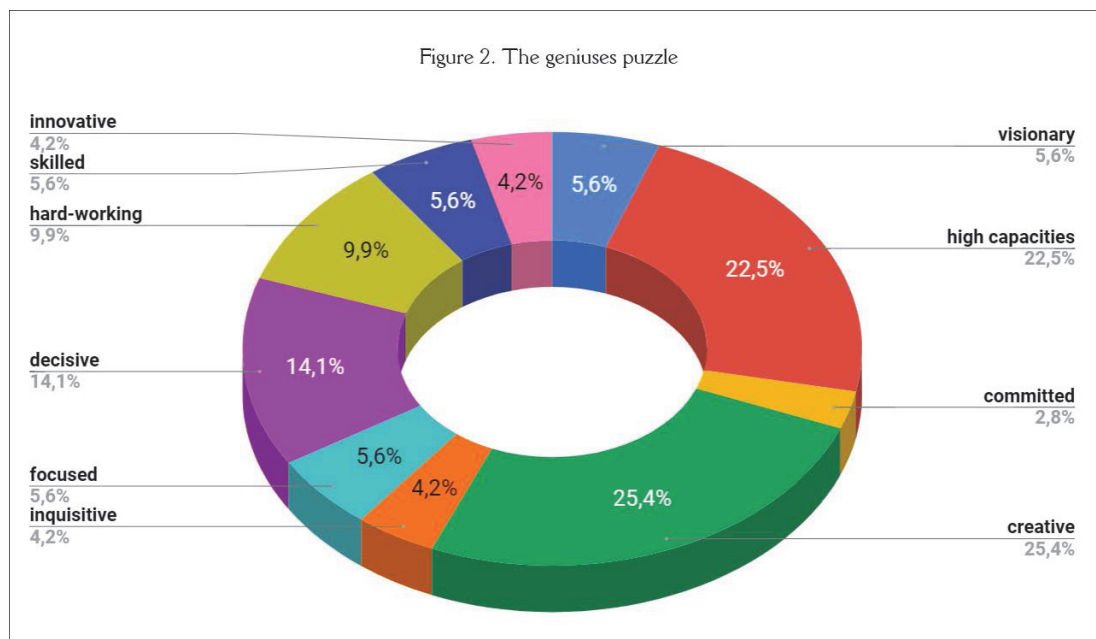
The field study results partly match the proposal of Olszewski-Kubilius et al. (2015), which states the double necessity of rethinking those HIA only connected to the intellectual aspect, and building development trajectories to reach eminence. This eminence produces talent domains which can only appear after intense work, research and/or dedicated practice. Thus, based on these indicators, a map containing different teaching dimensions/trajectories is hereby proposed.

3.2. Layout of the teaching proposal

The idea of a puzzle is shared with the International Giftedness Society (Barbería, 2018), where HIA are considered, in addition to the intense neuronal activity related to tree thinking, as the components of the giftedness formula. It would be advisable to create, develop and/or strengthen said social skills, without losing sight of the brain's plasticity.

Thus, sooner or later, the equation would have to assume that social skills are a fundamental element. In this regard, the contributions of Furman (2016) encourage the development of itineraries integrated in

the framework of an ecosystem formed by challenge and exploration spaces. These are supported by a scaffold that helps organize what has been learned into ideas and thinking strategies, where technologies enhance the possibility of inventing, solving problems and dealing with solutions. Her model proposed to contextualize learning, participate in authentic practices and create reflection spaces in order to visualize thoughts; which could be combined with different practices (Van-Tassel-Baskar, 2016) and individualizing interventions (García-Guardia et al., 2019).

In relation to technology, attention should be placed on big data. There is an increasingly prevalent trend which claims that a real revolution will take place whenever we are able to know a person so well that teaching is adapted to their actual education level, their learning pace and their way of absorbing information (Harari, 2016).

Another practice worth mentioning in this work involves Harvard, where work is increasingly being done with the case study method as well as with the mentoring and sponsorship system among their students under the premise of innovating, risking, inspiring and transforming. In Spain, Pompeu Fabra University has implemented a system of open courses around a university access program where students can take courses from different undergraduate programs, and the role of the tutor-mentor gains importance. There are also experiences with global bachelor's degrees without borders which implement new courses of studies, as in the proposals of the Interamerican Open University. At the other end, there are self-educated experiences around success cases, such as the Silicon Valley model, where merit seems to reside in being -or having been- a university deserter.

That said, from the university point of view, the real challenge seems to be adapting, evolving and creating a new ecosystem for the so-called new geniuses to feel valued, either because they know they are geniuses, or because their own environment has let them be aware of it. In this framework, the "Educational Model TEC21" (2018) presents four components:

1) Challenge-Based Learning (which combines experience, cognition and behavior);

2) Flexibility (a curriculum model of trajectories to explore, decide and become specialized: global, diverse and multicultural learning community, entrepreneurial challenge with a human sense);

3) Memorable university experiences: leadership and entrepreneurial spirit, implementation of new ideas to transform the reality generating cultural value.

4) Inspirational, updated, connected and innovative professors, who are IT users and play the role of advisor, consultant, mentor, challenge designer and university professor. All this is complemented by a learning program based on challenges, competences and learning modules.

Along this same line, the "Reporter Deliberate Innovation, Lifetime Education" (2018) sets the premises for university education in 2040 based on 1) Interpersonal education (cognitive skills -problem solving and creativity, interpersonal skills -communication and leadership, and intra-personal skills - adaptability and discipline), experiential learning, critical thinking, multicultural environments and research; 2) Generation of new products or services; 3) Counseling + training with learning databases and Artificial Intelligence assistants which support students + professional networks dedicated to students; 4) Personalized educational experiences + mentors and coaches; and 5) Decentralization with the creation of hybrid spaces, real and virtual portals for students.

Most of these ideas are shared by the "Radar of educational innovation" (2017), which is the result of a research carried out over the last pedagogical and technological lines of the western world. This work highlights five pedagogical trends, in general prospective studies and for all knowledge areas: Challenge-Based Learning, Competence-Based Education, Flexible Learning, Gamification and Project-Based Learning.

3.3. Itinerary and trajectories proposal in the new entrepreneurial scenarios

All above mentioned analyses emphasize the relationship with technological trends, which expose that adaptive learning models will prevail in social networks and collaborative environments, mobile, big data, learning analytics and open and massive online courses. These analyses conclude that increasingly personalized (and, at the same time, increasingly social) learning processes will arise. Therefore, by combining the strategies identified in the different reports with the elements derived from FW2, a learning

map or "itinerary" has been designed, outlining all requirements needed to become (if it has not happened yet) an "entrepreneurial genius". This itinerary, with its different paths, was intended to represent the idea that a real genius is that person who can make a permanent change in their life: to become an entrepreneur, and to do it socially.

These different dimensions have been summarized in a map similar to a metro line map (Figure 3), displaying the multiple possible combinations, depending on the starting point. So, the path begins on a central and nodal line (that everyone must always take): STREAM (Science, Technology, Robotics, Engineering, Arts & Mathematics). Probably, the student has already taken one of these courses of studies; if that is the case, the student will be able to advance faster by doing a microlearning on each of these sciences. Afterwards, the student should complete this learning with small knowledge pills related to other disciplines: History, Philosophy, Anthropology and Sociology.

From this moment on, the student, assisted by mentors, professors, coaches and tutors… should perform a self-assessment. The student should also carry out a peer assessment with their counseling team in order to complete their training in social skills and in the acquisition of agile tools and methodologies. All this should be linked to their experience within the entrepreneurial environment in real, virtual and multicultural university campuses, which validate their projects through "learning journeys" and immersion experiences related to the business and entrepreneurial world. It is always possible to combine "stations", or to revisit the ones already passed through. It is also possible to "skip" some non-decisive or unnecessary learning stations which already belong to the student's curriculum. In any journey, it is possible to make connections with/trips to any one of the outlined fields: academic, professional or entrepreneurial (in its two aspects).

Figure 3. Itinerary and learning journeys
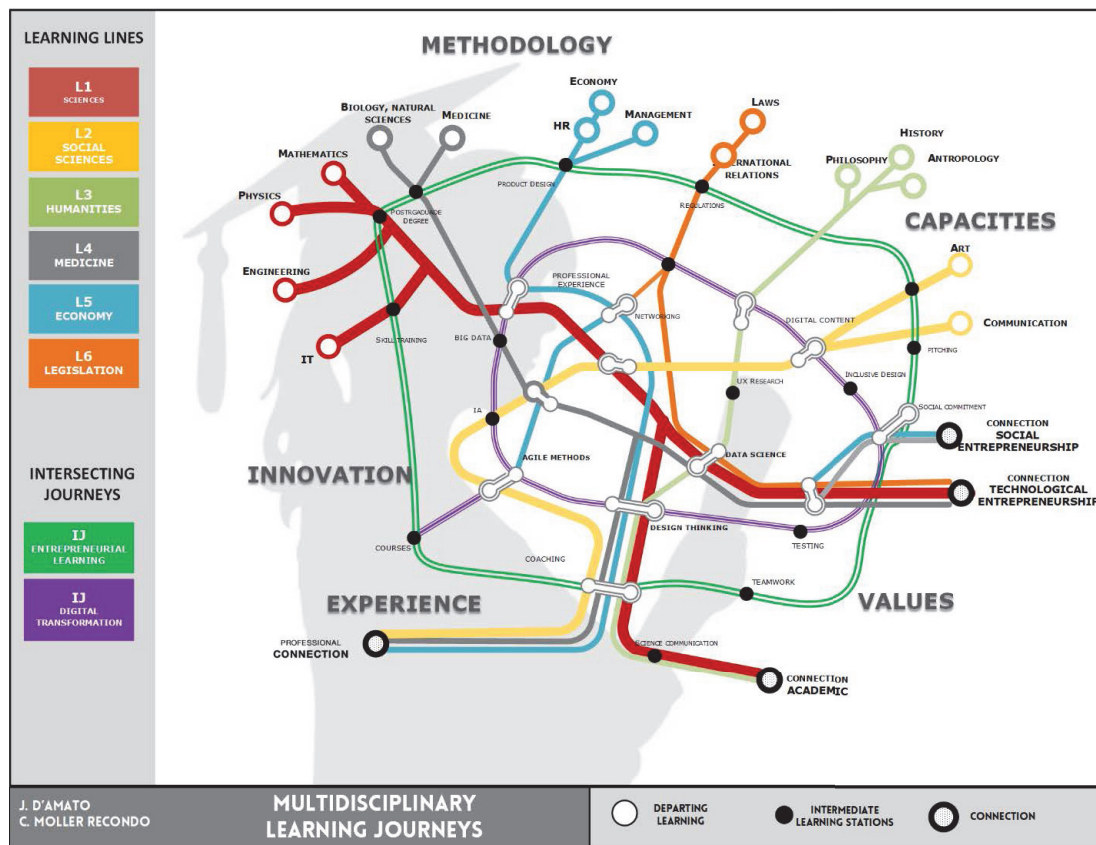
In order to illustrate what has been said, we can use the example of a young mathematician that creates a (mathematical) model that helps to optimize water management. Certainly, in order to materialize his theory into a product/application/social network, the feasibility of his idea needs to be assessed. This assessment should be performed from a technical point of view (for which the scientific system already has certain rules based on validated scientific demonstrations), as well as for practical and conceptual confirmation. In this context, the mathematical entrepreneur needs to make a disciplinary outline which allows him to understand how to implement his product (micro-learning: agile methods, big data), by testing his idea in real environments outside the University (micro-learning: professional experience, networking, ux research), with a social -not only economic- purpose. Figure 4 represents this journey.

Figure 4. Itinerary instance in a hypothetical case of social entrepreneurs at the University level
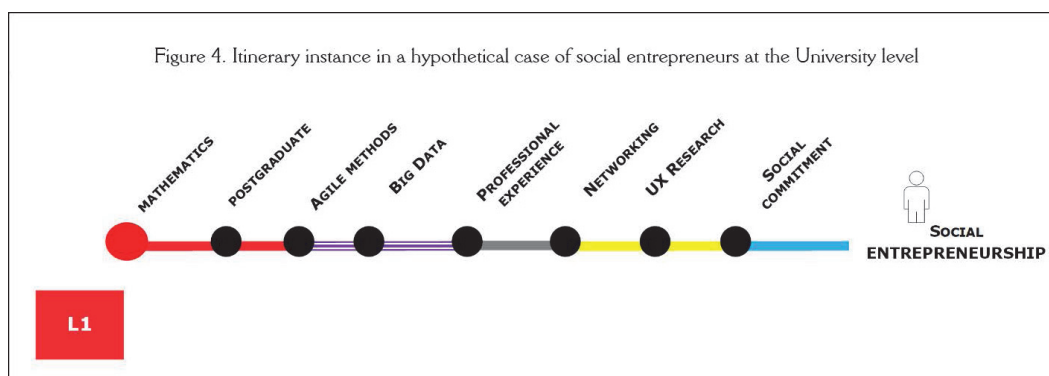
3.4. First success cases

It is ideal that this work's proposal is carried out in the context of a social entrepreneurship lab, due to its experimental nature. In Spain, there are only three university proposals for implementation: Huelva, Granada and Valladolid. However, only this last one fosters the social entrepreneurship "strictu sensu", with a learning and entrepreneurial competence acceleration plan and a series of proposals developed by students. These proposals aim at identifying a social need or problem, and proposing a creative and innovative solution (not necessarily technological) to it (Möller-Recondo, 2020).

Lately, work is being done in parallel with idea-booster experiences, such as learning journeys with unconventional application practices. FW2 (Cáceres and Valladolid) presents the results of development and entrepreneurial competence acceleration programs: 4 years, 2 state universities, one course from the Social Education undergraduate program, 150 students involved, 42 creative communities and several challenges visualized, which show the concerns of students: mental health, pollution, art culture, and above all, inclusion.

On the other hand, a multidisciplinary learning program, which lasts one year, has been offered in Argentina (Tandil) with the same objectives, for the creation of projects based on the "User centered design" method. This program covers STEAMS knowledge, such as technology and art design, leading it to the creation of social and inclusive projects. From its beginning in 2017, 120 students have participated with different experiences, such as the design of user interfaces for visually impaired people (UNICEN, 2019).

In anonymous surveys about student satisfaction, 98,7% of students indicated that they felt motivated at the end of the theoretical lessons about social entrepreneurship, entrepreneurial culture and social inclusion (micro-learning.) They highlighted the importance of agile methodology implementation in order to regain motivation, develop creativity and be able to have a strong entrepreneurial attitude. This attitude revealed talents and capacities most of them did not know they had.

4. Discussion and conclusions

Probably, the lack of reflection on genius (beyond HIA) has caught the concept in the past history, and consequently, at least two different situations have been generated that should be resolved. Those students with specific different capacities have been excluded from the educational system -or have been

included as different- and at the same time, the university ecosystem has been unable to identify them, and thus, wasted their potential. Hence, the concept of genius should be reconsidered, and the construction of stereotypes, profiles and taxonomies should be avoided.

The new genius is that person who can, in the first place, undertake their own teaching-learning journey "by taking several metro lines", and can create, manage, develop and/or enhance capacities, skills, tangible and intangible aspects, knowledge and competences, assisted by mentors, tutors, counselors and professors. This person should learn to feel emotional and be able to prepare their own trajectories, by moving around in hybrid environments (real, virtual and multicultural.) This person should have a core STREAM education in the competences they do not naturally have, but that should be complemented with the study of other sciences, such as Sociology and Anthropology (in order to see society closely and from a distance). They should also learn about Philosophy, since that will be the tool to differentiate them from robots; and about History, since they will need to know about the past in order to look for ways to solve the same problems the world has nowadays. All this, together with new technologies, should allow them to drive themselves to the future in order to lead the way from the present.

The challenge is now for the university community to be able to develop an adaptive method to detect the needs unnoticed by society. Those needs should then be turned into challenges, be analyzed, dissolved, solved and given back to that same society in the form of inclusion and for the common good. Said method should be sufficiently flexible and agile so that it can integrate everything that responds to the changing needs of the environment. It should also be attractive to current students and also to those who wish to rethink their professional profile.

It is proposed that all this process is framed within a social entrepreneurship format in the context of sustainable development. This process should be led by those who are geniuses by birth. It should also be led by those who become geniuses, because they find out (and find themselves in) the motivation created by the feeling of being part of projects that help them show their talents, as well as foresee a working future and, in that way, create a social community.

Funding Agency

References

Aretxaga-Bedialauneta, L. (2013). *Orientaciones educativas. Alumnado con altas capacidades intelectuales*. Servicio Central de Publicaciones del Gobierno Vasco. https://bit.ly/2WJppmq

Barbería, J.L. (2018). Superdotados, el puzle de las altas capacidades. https://bit.ly/39N30sn

Castelló-Tarrida, A. (2001). *Inteligencias. Una integración multidisciplinar*. Masson.

Commission on Creating the Next in Education (Ed.) (2018). Deliberate innovation, lifetime education. Institute of Technology Georgia. https://b.gatech.edu/2xkAIwc

Consejo Superior de Expertos en Altas Capacidades (Ed.) (2014). *Guía científica de las altas capacidades. Consejo Superior de Expertos en Altas Capacidades*. Consejo Superior de Expertos en Altas Capacidades. https://bit.ly/2J5cL9D

Del-Barrio, A. (2009). Alberto Royo "Los nuevos gurús educativos no son profesores". http://bit.ly/2QOmNlw

Faverón-Patriau, O. (2018). *El poder en el siglo XXI. Las startup y las empresas unicornio*. Amazon.

Furman, M. (2016). *Educar mentes curiosas: La formación del pensamiento científico y tecnológico en la infancia*. Fundación Santillana. https://doi.org/10.25115/ecp.v10i20.1015

García-Guardia, M., Ayestarán-Crespo, R., López-Gómez, J., & Tovar-Vicente, M. (2019). Educating the gifted student: Eagerness to achieve as a curricular competence. [Educar y formar al alumno talentoso: El afán de logro como competencia curricular]. *Comunicar*, *60*, 19-28. https://doi.org/10.3916/C60-2019-02

Gardner, H. (1993). *Las inteligencias múltiples. La teoría en la práctica*. Paidós. https://bit.ly/2QUMX4n

Harari, Y. (2016). *Homo Deus. Breve historia del mañana*. Debate. https://doi.org/10.17104/9783406704024

López, A., & Moya, A. (2011). Conceptos generales del alumno con altas capacidades. In Torrego-Seijo, J. (Ed.), *Alumnos con altas capacidades y aprendizaje cooperativo. Un modelo de respuesta educativa* (pp. 13-33). Fundación SM. https://bit.ly/2WJrYF4

Martín-Gálvez, J., & González-González, M.T. (2000). *Alumnos precoces, superdotados y de altas capacidades*. Ministerio de Educación y Cultura, Secretaría General de Educación y Formación Profesional, Centro de Investigación y Documentación Educativa. https://bit.ly/3ae4f41

Martínez-l-Torres, M., & Guirado-Serrat, A. (2012). *Altas capacidades intelectuales. Pautas de actuación, orientación, intervención y evaluación en el período escolar*. Graó.

Möller-Recondo, C. (2015). Comunidades creativas en torno a un proyecto de gestión cultural, en el ámbito universitario, con alumnos y alumnas del Grado de Educación Social de la Universidad de Extremadura. *Culturas. Revista de Gestión Cultural*, *2*, 21-21. https://doi.org/10.4995/cs.2015.3759

Möller-Recondo, C. (2020). Un PID de Excelencia: El laboratorio de emprendimiento social de la Universidad de Valladolid. In L. Belmonte Ureña, J. Gázquez-Linares, M. Simón-Márquez, J. Soriano-Sánchez, N. Oropesa-Ruiz, A. Martos-Martínez, & A. Barragán-Martín (Eds.), *Innovación docente e innovación en ciencias sociales, económicas y jurídicas* (pp. 725-736). Dykinson. https://bit.ly/2Jr57GA

National Association for Gifted Children (Ed.) (2019). *Pre-K to Grade 12 Gifted Programming Standards*. NAGC. https://bit.ly/2wfJiEd

Olszewski-Kubilius, P., Subotnik, R., & Worrell, F. (2015). Re-pensando las altas capacidades: Una aproximación evolutiva. *Revista de Educación*, *368*, 40-65. https://doi.org/10.4438/1988-592X-RE-2015-368-297

Pérez-Sánchez, L., & Beltrán-Llera, J. (2006). Dos décadas de 'inteligencias múltiples': Implicaciones para la psicología de la educación. *Papeles del Psicólogo*, *27*(3), 147-164. https://bit.ly/2Jb1Hrv

Riba, S.S., & Tarrida, A.C. (2017). Fiabilidad y estabilidad en el diagnóstico de la alta capacidad intelectual. *Revista de Neurología*, *64*(1), 51. https://doi.org/10.33588/rn.64s01.2017028

Sastre-Riba, S., Fonseca-Pedrero, E., & Ortuño-Sierra, J. (2019). From high intellectual ability to genius: Profiles of perfectionism.[Desde la alta capacidad intelectual hacia el genio: Perfiles de perfeccionismo]. *Comunicar*, *60*, 9-17. https://doi.org/10.3916/C60-2019-01

Sastre-Riba, S., Pérez-Sánchez, L.F., & Villaverde, A.B. (2018). Programs and practices for identifying and nurturing high intellectual abilities in Spain. *Gifted Child Today*, *41*(2), 63-74. https://doi.org/10.1177/1076217517750703

Tárraga, R., Sanz-Cervera, P., Pastor, G., & Fernández, M. (2014). Herramientas TIC para la intervención educativa en estudiantes con altas capacidades. Un estudio de caso. *Revista Didáctica*, *Innovación y Multimedia (DIM)*, *30*, 1-18. https://bit.ly/2xhfqKA

Tecnológico de Monterrey (Ed.) (2017). *Radar de Innovación educativa*. Instituto Tecnológico de Estudios Superiores de Monterrey. https://bit.ly/3blmYL3

Tecnológico de Monterrey (Ed.) (2018). *Modelo Educativo TEC21*. Instituto Tecnológico de Estudios Superiores de Monterrey. https://bit.ly/2Uw9XHJ

Universidad del Centro de la Provincia de Buenos Aires (Ed.) (2019). Ciclo de formación en diseño inclusivo de experiencias de usuario. https://bit.ly/2lKxk34

Van-Tassel-Baska, J. (2016). *Programa y plan de estudios para los alumnos con altas capacidades. ¿Qué aspectos son imprescindibles?* Máster en Neuropsicología de la Alta Capacidad Intelectual. https://bit.ly/3dhn1cy

eHealth literacy of late adolescents: Credibility and quality of health information through smartphones in India

Alfabetización en e-Salud de los jóvenes: Credibilidad y calidad de la información sanitaria con móviles en la India

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ABSTRACT

The introduction of smartphones has revolutionized how late adolescents (aged 18-21 years) access and use the internet. Vast troves of health information are today just a tap or swipe away, with smartphones and internet connectivity becoming increasingly accessible. The need for eHealth literacy among late adolescents is now gaining importance as it ensures an effective use of health information. This study conducted a survey among 427 late adolescents in order to evaluate their eHealth literacy levels; their perceptions of the quality of online health information; their level of trust and credibility in online health and checked if acquiring health information through the online medium led to a change in their behavior intention. The results showed that most of the late adolescents preferred viewing multiple websites for their health information needs. Health information in the form of text and images were preferred over video content; and most preferred accessing online health information in their native language. Cancer and obesity are the common health issues of interest to both genders. Mobile applications (apps) were the least preferred mode of accessing heath information despite the high usage of smartphones. eHealth literacy and credibility positively predicted behavior intention while quality of health information did not predict behavior intention.

RESUMEN

La introducción de los smartphones (teléfonos inteligentes) ha revolucionado la forma en que los adolescentes tardíos (de entre 18 y 21 años) acceden y usan Internet. Hay una gran cantidad de información a solo un toque de distancia y los teléfonos móviles y la conectividad a Internet son cada vez más accesibles. La necesidad de aprender acerca de eSalud entre los adolescentes tardíos ahora está cobrando importancia, ya que garantiza un uso eficaz de la información de la salud. En este estudio se realiza una encuesta a 427 adolescentes tardíos para evaluar sus conocimientos en eSalud; sus percepciones de la calidad de la información de la eSalud; su nivel de confianza y credibilidad en eSalud y verificar si la adquisición de información de salud a través de este medio conduce a un cambio en su intención de comportamiento. Los resultados mostraron que la mayoría de los adolescentes tardíos preferían ver múltiples páginas web para sus necesidades de información de salud y la mayoría preferían acceder a información de eSalud en su idioma nativo. Las aplicaciones móviles (apps) eran el método menos usado para acceder a la información de salud a pesar del alto uso de smartphones. La alfabetización y la credibilidad de eSalud predijeron positivamente la intención de comportamiento, mientras que la calidad de la información de salud no predice la intención de comportamiento.

KEYWORDS | PALABRAS CLAVE

Health Information, eHealth Literacy, mobile health, adolescents, mHealth, credibility, quality, online health information.
Información de salud, alfabetización de eSalud, mSalud, adolescentes, salud móvil, credibilidad, calidad, información de la salud en línea.

1. Introduction

Health Literacy as a concept developed in the 1970s and dealt with people's ability to take decisions regarding their health. A person's capability to effectively gather health information, engage in discussions with health care providers and to make necessary changes to behaviors and lifestyles can be termed as health literacy. Health literacy directly correlates with healthy behaviors and responsible decision-making about an individual's health needs (Aaby et al., 2017; Guntzviller et al., 2017). When an individual has low levels of health literacy, they are most likely to display problems in various aspects related to their health. People today do not exclusively depend on their physicians for health information; rather they avail wide variety of options that are now available for all their health information needs (Boberg et al., 2015). This is especially true in cases where traditional sources fail to meet individual requirements (Spence et al., 2013). Some of the secondary sources of information are newspapers, radio and television but the most influential is new media (Vargo, 2014). The emergence of new technology has resulted in many people seeking out information online. Teenagers are increasingly using the internet for their health information needs (Kwan et al., 2019).

In India, access to smartphones is expanding rapidly and many have access to low cost internet (Mathi, 2019). Doctors, medical experts, scientific research, home remedies, etc. are also now increasingly shifting to the online platform. Between the ages of 15-20 years, individuals start to develop an interest in learning about their health and develop the requisite skills to look for both specific as well as general health information (Borzekowski et al., 2006). The ZOCDOC report has pointed out that 90% of Generation Z has never initiated any sort of physician check-up, yet, many individuals are very optimistic about the internet as a source of health information (Mangan, 2015). Health information is now available 24/7 and can be accessed anywhere using a wide variety of options like web pages, social networking sites, mobile applications, etc. (Deng et al., 2015). The use of new media to obtain health information may be due to various reasons. First, the cost of a general physician visit may have increased; second, new media is used to cross check the health information provided by the physician; third, it is used to get clarification for questions that were missed out in the physician's visit; fourth, it is used to get information on being diagnosed with a new disease; fifth, the cost of searching for health information is reduced when using the internet (Metzger, 2007; Yan, 2010; Walsh, 2016).

Smartphone use among teenagers has witnessed a steep rise around the world (Lemola et al., 2015). According to the Pew research 2015, nearly 90% of teenagers access the internet through various means which includes using their smartphones (Wartella, 2016). The advent of the smartphone era has seen a tectonic shift in gathering health information through smartphones (Abroms et al., 2012) and has even become popular among teenagers. The process of using a smartphone by an individual to conduct health research and to improve his/her health behavior is referred to as mHealth (Mitchell et al., 2014). Credible health information which is not properly understood will lead to severe health issues (Deng et al., 2015). It is also essential for an individual who gathers the health information to analyze it critically in order to use in it in a proper way. He/She should be able to understand a variety of health information and treatment options available online (Ghaddar et al., 2012). The study focuses on late adolescents (18-21 years) access and use of health information online.

Ability to gain knowledge and understanding a complex situation reaches a peak when a person reaches late adolescence. Therefore, this is a significant period for acquiring and using health information (Pasupathi et al., 2001). As a result, it is easy for late adolescents to become literate about the health issues that concern them and they also have the requisite understanding and implementing capacity in their life. The risk here is that health information obtained online can be misused; or if the wrong information has been fetched, it can lead to poor health outcomes (Diviani et al., 2019; Deng et al., 2015). The Uses and Gratification theory (1974) deals with people usage of various media on how their needs or desires decide their media choices. According to the theory different media serve different needs and in that context one can be viewed as being better than another. Similarly, new media can also replace older ones, if they provide greater satisfaction (Lee & Hawkins, 2010). Therefore, people actively choose which media they consume in accordance with psychological and social needs (Korhan & Ersoy, 2016). This study aimed to measure the usage of smartphones among late adolescents to access health information, their opinions

about the content and the resulting impact in their lives. Specifically, the objectives of this study are to investigate among late adolescents: a) To assess their smartphone usage for acquiring health information; b) To check their eHealth literacy level; c) To evaluate the level of trust and credibility that they have on online health information; d) To find out how they perceive the quality of health information that they find online; e) To check whether the acquired health information led to a change in behavior intention among late adolescents. The study is based on the uses and gratifications theory to understand how late adolescents use mobile phones to search for health information.

1.1. eHealth literacy

eHealth literacy' is an indicator of how able an individual is to effectively seek out, identify and evaluate the requisite health information needed to make informed health decisions and how he applies the gained knowledge practically in his life. While individuals need to equip themselves with the necessary competencies to improve their eHealth Literacy levels, medical professionals must also optimize the benefits of eHealth technologies by understanding existing eHealth literacy levels among the general public (Chung & Nahm, 2015).There are six components of eHealth literacy: 1) Traditional skills; 2) Health literacy; 3) Information literacy; 4) Scientific literacy; 5) Media Literacy; 6) Computer or smartphone literacy (Norman & Skinner, 2006). eHealth literacy is the outcome of an individual's perception and skills, especially his knowledge acquiring skills.

1.2. Quality of health information

The lack of content regulation on the internet is cause for concern as people do not depend on health professionals to interpret/validate the content (Eysenbach, 2003; Marshall & Williams,2006). Good quality content acts as an incentive for people to use it while poor quality of information can misguide (So et al., 2019). When health information is misunderstood, it may cause health risks and result in improper behavior change among users (Deng & Liu, 2017). Analyzing the quality of information is not always easy. Some of the criteria used by people in judging content are whether a source is provided, whether there is scope for commenting/asking questions or seeking further help, whether the information can be easily retrieved and whether the user's information needs are met (Neter & Brainin, 2012).

1.3. Credibility

There is no universal standard for posting health information online. Such information can be altered, edited, misrepresented or created anonymously. In the past, there was a limited source of health information contributors, most of whom were from a reputed source, thus increasing their credibility (Metzger, 2007). But the advent of online portals has encouraged everyone to post their own content, which raises questions about the credibility of the content. Young minds that use these platforms are exposed to major health content which is why credibility is scrutinized so much. Given the difficulty in identifying credible content online, various initiatives have been undertaken to help content users like rating tools, portals like OMNI that list high quality websites and quality labels like HON code. In research various checklists and tools have been developed to help evaluate content.

1.4. Behavior intention

Behavioral intention is a measure as to how likely a person is to perform a particular behavior (Mamman, 2016). The ultimate goal of eHealth is to establish and develop the desired behavior among users. Longitudinal studies and/or an experiment followed immediately by the measurement of the actual behavior would be more definitive, of course, but seldom practical. As an alternative, scholars have long relied on respondents' behavioral intentions as a close predictor of actual behavior (Hu & Sundar, 2010):

- H1: There will be a positive influence on behavior intention when students have high eHealth literacy.
- H2: Credible online health information will positively predict behavior intention among students.
- H3: The higher the quality of information, the higher the level of positive influence in the behavior intention.

2. Method

The study used the survey method which was conducted in Chennai, India during the month of November 2019. The city of Chennai was subdivided into three zones. In each zone, five colleges were selected randomly and within each college 30 students were selected using simple random sampling. Permission was obtained in each institution to conduct the study. Respondents were briefed on the purpose of the survey and no honorarium was paid. Out of 450 surveys collected, 23 were eliminated because of missing data.

This research used the eHEALS Literacy Scale by Norman and Skinner (2006) to understand how late adolescents acquire health information through smartphones. The eHeals scale is a validated scale developed to quantify eHealth literacy by measuring the skillsets that people used when obtaining health information from various information technology devices (Koo et al., 2012). This study used the Discern Handbook for measuring the quality of health information. The Discern handbook consists of standardized criteria to evaluate the quality of written online health information on treatment options (Charnock & Shepperd, 2004). It is a critical appraisal tool that has validity and a good inter-rater agreement. This study tests the perceived credibility among college students using the credibility scale from Kienhues & Bromme (2012) and Hu and Sundar (2010).

2.1. Analysis

SPSS software was used to analyze the data. For variables like eHealth, quality of health information, credibility, and behavior intention mean and standard deviation of summated scales were calculated. Construct validity was tested using factor analysis with factors extracted using the scree plot and the Eigen value of above 1. Suitability of data was tested using the Kaiser-Meyer-Olkin (KMO) method and Bartlett's test. Convergent validity was tested using reliability (Cronbach's alpha) and factor loading for all the factors. Medical experts, care givers, social scientists, and social media users were used to analyze the questions for face validity. Regression analysis was used to test hypotheses. For all scale variables, a Likert scaling method was used with the regular interval from strongly disagree (1) to strongly agree (5). For quality of health information alone, a 3-point Likert scale was followed.

3. Result

Of the 427 participants 51.4% were male and 48.6% were female with a mean score of 19.52 and standard deviation of 1.445. It was found that all the participants had a smartphone (100%) and 78.3% had their own laptop. The preferred mode of accessing online information was through the smartphone (84.1%) followed by the laptop/computer (13.2%) and other modes (2.7%). A majority of 94.6% of students used the smartphone to access health information.

When the college students were asked about when their last search for health information had taken place, 26.3% said that it had been in the last five days before completing the survey. The highest percentage of students (35.7%) searched for health information 5-10 days before the administration of the survey (Table 1).

Table 1. Searches made by participants by day	
Last online search	**Health (%)**
0-5 Days	26.3
5-10 Days	35.7
10-15 Days	19.5
15-30 Days	15.6
Last Month	2.9

When asked for the purpose of searching for health information online, 82.8% said that they used to search for information in order to lead a healthy lifestyle. The second most popular reason was to cross-check information provided by the physician (79.3%). The third most popular reason was to find more information when someone known to them was diagnosed with a medical condition (74.8%) (Table 2).

Table 2. Purpose of searching online health information		
Purpose	**Yes (%)**	**No (%)**
I have struggled to meet the general physician	19.4	80.6
I feel that charges for meeting the general physician are high	35.5	64.5
The internet helps in cross checking the information provided by the physician	79.3	20.7
The internet helps to answer the questions that I forgot to ask to physician	41.9	58.1
I am able to find the Disease-specific information on the Internet	64.6	35.4
I used to search for general information on healthy lifestyle	82.8	17.2
When I am diagnosed with a new health problem	65.3	36.7
When I am dealing with an on-going medical condition	12.9	87.1
When I was prescribed a new medication or course of treatment	43.6	56.4
When I don't have time to go to my physician	22.6	77.4
When I am unable to get a referral or an appointment with a specialist	25.9	74.1
When someone I know is diagnosed with a medical condition	74.8	25.2

The preferred language for accessing health information was mother tongue /native language (Tamil, Telugu, Malayalam, Hindi, and other native languages of India) with a score of 87.4%, followed by English 12.6%. According to 51.5%, the last health information that they accessed was in their mother tongue, while 48.5% accessed it in English (Table 3). Using chi-square analysis, it was further tested if there was a difference between the preferred language and the language in which the health information is obtained. The Chi-square value of 129.165 with the P<0.001 and the df of 1 shows that there was a significant difference.

Table 3. Language preference for health information among late adolescents		
Language	**Preferred (%)**	**Consumed (%)**
Mother tongue	87.4	51.5
English	12.6	48.5

Among the recent health searches made by the participants' diabetes and thyroid (8.9%) were the top issues searched for by males, while among females it was menstrual issues (15.8%) and headache (6.1%). Overall, among both genders, obesity (27.6%) and cancer (23.6%) were the most searched issues. Among all students, 26.3% preferred accessing a combination of text and picture followed by 22.8% that accessed in video form alone (Table 4). It was found that search engines (82.7%) played a significant role in health information fetching, followed by video streaming sites (10.3%). The usage of mobile health applications was quite low at 2.3%. A majority of students (88.4%) switched between multiple pages or more than one site for their health queries.

Table 4. Kind of health information	
Kind of health information	**Percentage**
Mix of all	19.3
Text and picture	26.3
Text and video	8.8
Video and Picture	5.3
Picture	3.5
Text	14
Video	22.8

The eHealth literacy scale was adopted from the eHEALS scale by Norman (2006). Statements like 'I know how to find helpful health resources on the Internet' was rated by the students on a 5-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. High mean value near 5 was a positive comment about the factor, the respondents' option about that particular factor is approving. A total of eight statements were rated for this variable. The result showed a mean value of 3.998 and with a standard deviation of 0.507 (Table 5).

Table 5. Variable statements and mean value		
Statement	Mean	SD
eHealth Literacy • I know how to find helpful health resources on the Internet • I know how to use the Internet to answer my health questions • I know what health resources are available on the Internet • I know how to use the health information I find on the Internet to help me • I have the skills I need to evaluate the health resources I find on the Internet • I can tell high quality from low quality health resources on the Internet • I feel confident in using information from the Internet to make decisions	3.998	0.507
Credibility • The information that I read/viewed online is accurate. • The information that I read/viewed is believable. • One can almost always receive verified medical information from the Internet. • The Internet almost always contains reliable statements with regard to medical research. • The Internet is a trustable source for gathering medical findings. • One should almost always critically scrutinize medical information from the Internet. • I can trust the information that I get from the online platform.	3.599	0.497
Discern Handbook / Quality of health information • Are the aims of online health content clear? • Does it achieve its aims? • Is the health content relevant? • Is it clear what sources of information were used to compile it? • Is there a clear indication of the date of posting on online content? • Is the health information balanced and unbiased? • Does it provide details of additional sources of support and information? • Does it refer to areas of uncertainty? • Does it describe how each treatment works? • Does it describe the benefits of each treatment? • Does it describe the risks of each treatment? • Does it describe what would happen if no treatment is given? • Does it describe how the treatment choices affect overall quality of life? • Is it clear that there may be more than one possible treatment choice? • Does it provide support for shared decision-making?	2.134	0.347
Behavioral Intention • I intend to continue seeking health information from the Internet. • I plan to continue using the Internet to obtain health information. • If I could, I would like to discontinue seeking online health information. • I used to act on the advice that is offered in the online messages • I recommend the health advice that I read online to my friends and family members. • Online health information heavily influences my personal health decisions. • I use online health information to cope with my emotions such as fear, stress, and frustration.	3.783	0.542

To check student's perception of credibility of online health information, we adopted the scale from Kienhues and Bromme (2012) and Hu and Sundar, (2010). Statements like 'One can almost always receive verified health information from the Internet' were rated by the students on a 5-point Likert scale ranging from 'strongly disagree' to 'strongly agree.' A total of seven statements were rated for this variable. The result showed a mean value of 3.599 and a standard deviation of 0.497 (Table 5). The quality of health information scale was adopted from the Discern handbook. Statements like 'Is the health content relevant?' was rated by the students on a 3-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. A total of sixteen statements were rated for this variable. The result showed a mean value of 2.134 and a standard deviation of 0.347 (Table 5).

The behavior intention scale was adopted from the study of Liang et al. (2011) and Hu and Sundar (2010). Statements like 'I intend to continue seeking health information from the Internet' was rated by the students on a 5 point Likert scale ranging from 'strongly disagree' to 'strongly agree'. A total of seven statements were rated for this variable. The result showed a mean value of 3.783 and a standard deviation of 0.542 (Table 5). Factor analysis was used in order to test the scale and item measures. KMO value of 0.831 and Bartlett's test p-value of 0.000 was significant and therefore factor analysis was conducted.

Average variance extracted for 4 factors was 78.034% which is also above the Eigen value of 1. Principal component extraction method was used and varimax rotation was followed. The factor loading for all the items ranged from 0.724 to 0.817. Internal consistency of each scale item was measured with Cronbach's Alpha, scores of eHealth was 0.757, credibility was 0.783, behavior intention was 0.812, and quality of health information was 0.748.

H1, H2, H3: The linear regression was calculated to check the level in which variables such as eHealth literacy, credibility, and quality of health information predicted behavior intention. eHealth predicts behavior intention strongly with an R^2 value of 0.741 and a t-value of 6.983. Credibility also predicts behavior intention with a t value of 4.431 and an R^2 value of 0.581. For variable quality, there is no significant association with a t-value of 1.562 and a low R^2 value (0.057). Therefore, hypothesis 1 and 2 are proven: There is positive influence on behavior intention when students have high eHealth literacy; credible online health information positively predicts the behavior intention among the students. Hypothesis 3 was rejected (Table 6).

Table 6. Regression analysis of eHealth literacy, credibility and quality of health information									
	Mean	Std. Deviation	Standardized coefficient	T	Sig.	f	df	Sig.	R^2
eHealth	3.9987	.50700	0.618	6.983	0.000	34.451	1, 426	0.000	0.741
Quality	2.1349	.34734	0.238	1.562	0.074	3.313	1, 426	0.074	0.057
Credibility	3.5991	.49745	0.454	4.431	0.000	27.516	1, 426	0.000	0.581

4. Discussion

Health information seeking behaviour is vital to maintaining good health among college students (Deng & Liu, 2017). The results of the study indicate that smartphones play a significant role in health information gathering. This might be because of the enhanced smartphone usage and the low cost of internet in India compared to other countries (Deng & Liu, 2017). The use of internet to seek health information and the particular dependence on websites is also in line with the uses and gratifications theory that states that people seek out media which meets their specific requirements and needs (Lee & Hawkins, 2010). The majority of the late adolescents (62%) surveyed had searched for health information in the last week.

Most students preferred accessing health information in their mother tongue, but information available online is more often in English. Respondents also highlighted that search engines were their first choice to gather health information and mobile health applications were the least popular source of health information. Earlier research by Peng (2016) and Deb (2018) has also shown that many people rarely download health apps. There are several reasons. First, some people feel that they do not need a health app given their current healthy status. Second, many people drop off after initially trying the apps. Third, people doubt the credibility of an app. Fourth, people fear that their personal data and search history would be shared with third parties (Peng et al., 2016). Fifth, lack of awareness due to little or no mainstream marketing for health applications in India. Sixth, there is a perception that apps provide limited and mostly westernized treatment options and may not include alternate options like Homeopathy and Ayurveda.

It is a significant result that mobile applications for health monitoring are not popular among students even though they might use them to develop a healthy lifestyle. Late adolescents are not exposed to several health issues and as a result find installing health applications in their smartphone quite unnecessary (Cheng & Dunn, 2017; Mitchell et al., 2014). In order to increase app usage, it is suggested that focus be on first developing well designed apps at low costs providing relevant information, in multiple languages, that is credible (with sources detailed) and includes alternative treatment options (Deb et al., 2018). Creating awareness about the app and providing app literacy are two other important steps (Peng et al., 2016).

Though smartphones were used for health information gathering, text and image scores had the highest preference among the participants, with videos getting the second leading preference. Video streaming sites play a vital role in communicating health issues to late adolescents (Madathil et al., 2015). The health communicator therefore needs to target video streaming sites for the sharing of health information (Mitchell et al., 2014). The term 'disease' or 'health issue' for late adolescents in this study signified something serious and therefore they provided mostly serious replies when asked to identify the diseases or health issues for which they sought health information. Common health topics associated with this age group like acne

and body image are not perceived by late adolescents as being serious enough to be listed as a disease or health issue when questioned. Therefore, a majority of respondents in this study did not mention any issues related to their external appearance. The common health issues which are of major interest to both genders are cancer and obesity. According to Rajpal (2018) cancer is one of the emerging issues that India needs to concentrate on as the prevalence of cancer is increasing rapidly. In India approximately 130 million individuals are affected by obesity (Ahirwar & Mondal, 2019) and both genders are concerned about this issue.

The high mean value of eHealth literacy shows that late adolescents possess a strong health literacy, information literacy, scientific literacy, media literacy, and computer or smartphone literacy along with traditional skills. Health literacy is closely related to health information seeking behaviour and education levels (Lam & Lam, (2012). Neter & Brainin (2012) have also pointed out that eHealth Literate individuals are more likely to be younger. This study's respondents were young and had high educational qualifications, thereby proving both associations. UNESCO has introduced the term Media and Information Literacy (MIL), which highlights the importance of knowing how to access and navigate content on a specific media (media literate), as well as the importance of being able to access and critically evaluate content (Gretter & Yadav, 2016). This study shows that late adolescents are good, media and information literate candidates.

In this study, late adolescents were able to find health information but were found to be unable to effectively evaluate the quality of health information, even though they find the source to be trustable (Hu & Sundar, 2010; Eysenbach, 2003). Despite guidelines being present on how to evaluate health information published by various medical organisations, governments and academicians (Marshall & Williams, 2006) there is not much awareness about them.

Other researchers have ignored eHealth literacy as a potential mediating factor for behaviour intention. In this study, it was found that eHealth literacy strongly influences behaviour intention. It is worth noting that the late adolescents do not check the information on only one web page but rather visit multiple websites. They apply their analytical and cognitive skills to effectively gather and interpret health information. Late adolescents do not focus on the quality of the health content and therefore more awareness should be created on the importance of finding quality health information.

4.1. Limitation and recommendation

This study was limited to late adolescents and can extend to other age groups as well. As actual behaviour cannot be measured, behaviour intention was checked. Further studies can be extended to find links between eHealth literacy, credibility and behaviour intention as a mediation analysis.

4.2. Conclusion

More people are today turning to the online medium for their health information needs. The use of smartphones to access such information is also on the raise due to its highly portable nature and the low cost of internet access. Despite the popularity of smartphones among late adolescents, mobile applications (apps) are not as popular or preferred. Health communicators need to focus on creating awareness regarding eHealth literacy. There is no regularity mechanism to assure the credibility and the quality of online health information. Wrong health information can cause problems for the public. Despite having quality tools like HONCode and JAMA benchmark, they have not been effectively implemented across all websites. In the case of a multilingual country like India, it is essential to provide health information in all languages. Health information seekers should crosscheck information obtained online with their health care providers. For now, the need is to equip health information seekers with the requisite skill sets to effectively access and use online health information.

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References

Aaby, A., Friis, K., Christensen, B., Rowlands, G., & Maindal, H.T. (2017). Health literacy is associated with health behaviour and self-reported health: A large population-based study in individuals with cardiovascular disease. *European Journal of Preventive Cardiology*, *24*(17), 1880-1888. https://doi.org/10.1177/2047487317729538

Abroms, L., Padmanabhan, P., & Evans, W. (2012). Mobile phones for health communication to promote behavior change. *eHealth Applications*, *1*, 147-166. http://bit.ly/2TZcZ8p

Ahirwar, R., & Mondal, P.R. (2019). Prevalence of obesity in India: A systematic review. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, *13*(1), 318-321. https://doi.org/10.1016/j.dsx.2018.08.032

Boberg, E.W., Gustafson, D.H., Hawkins, R.P., Offord, K.P., Koch, C., Wen, K.Y., Kreutz, K., & Salner, A. (2003). Assessing the unmet information, support and care delivery needs of men with prostate cancer. *Patient Education and Counseling*, *49*(3), 233-242.
https://doi.org/10.1016/s0738-3991(02)00183-0

Borzekowski, D.L.G., Fobil, J.N., & Asante, K.O. (2006). Online access by adolescents in Accra: Ghanaian teens' use of the internet for health information. *Developmental Psychology*, *42*(3), 450-458. https://doi.org/10.1037/0012-1649.42.3.450

Charnock, D. (2004). Learning to DISCERN online: applying an appraisal tool to health websites in a workshop setting. *Health Education Research*, *19*(4), 440-446. https://doi.org/10.1093/her/cyg046

Cheng, C., & Dunn, M. (2017). How well are health information websites displayed on mobile phones? Implications for the readability of health information. *Health Promotion Journal of Australia*, *28*(1), 15-20. https://doi.org/10.1071/he15127 Chung, S., & Nahm, E. (2015). Testing reliability and validity of the eHealth Literacy Scale (eHEALS) for older adults recruited online. *Computers*, *Informatics*, *Nursing*, *33*(4), 150-156. https://doi.org/10.1097/cin.0000000000000146

Deb, K.S., Tuli, A., Sood, M., Chadda, R., Verma, R., Kumar, S., Ganesh, R., & Singh, P. (2018). Is India ready for mental health apps (MHApps)? A quantitative-qualitative exploration of caregivers' perspective on smartphone-based solutions for managing severe mental illnesses in low resource settings. *PloS One*, *13*(9), 1-19. https://doi.org/10.1371/journal.pone.0203353

Deng, Z., & Liu, S. (2017). Understanding consumer health information-seeking behavior from the perspective of the risk perception attitude framework and social support in mobile social media websites. *International Journal of Medical Informatics*, *105*, 98-109. https://doi.org/10.1016/j.ijmedinf.2017.05.014

Deng, Z., Liu, S., & Hinz, O. (2015). The health information seeking and usage behavior intention of Chinese consumers through mobile phones. *Information Technology & People*, *28*(2), 405-423. https://doi.org/10.1108/itp-03-2014-0053

Diviani, N., Fredriksen, E.H., Meppelink, C.S., Mullan, J., Rich, W., & Sudmann, T.T. (2019). Where else would I look for it? A five-country qualitative study on purposes, strategies, and consequences of online health information seeking. *Journal of Public Health Research*, *8*(1), 33-39. https://doi.org/10.4081/jphr.2019.1518

Eysenbach, G. (2003). The impact of the Internet on cancer outcomes. *CA: A Cancer Journal for Clinicians*, *53*(6), 356-371. https://doi.org/10.3322/canjclin.53.6.356

Ghaddar, S.F., Valerio, M.A., Garcia, C.M., & Hansen, L. (2012). Adolescent health literacy: The importance of credible sources for online health information. *Journal of School Health*, *82*(1), 28-36. https://doi.org/10.1111/j.1746-1561.2011.00664.x Gretter, S., & Yadav, A. (2016). Computational thinking and media & information literacy: An integrated approach to teaching twenty-first century skills. *TechTrends*, *60*, 510-516. https://doi.org/10.1007/s11528-016-0098-4

Guntzviller, L.M., King, A.J., Jensen, J.D., & Davis, L.A. (2017). Self-efficacy, health literacy, and nutrition and exercise behaviors in a low-income, Hispanic population. *Journal of Immigrant and Minority Health*, *19*(2), 489-493. https://doi.org/10.1007/s10903-016-0384-4

Hu, Y., & Sundar, S.S. (2010). Effects of online health sources on credibility and behavioral intentions. *Communication Research*, *37*(1), 105-132. https://doi.org/10.1177/0093650209351512

Kienhues, D., & Bromme, R. (2012). Exploring laypeople's epistemic beliefs about medicine – a factor-analytic survey study. *BMC Public Health*, *12*(1), 12-12. https://doi.org/10.1186/1471-2458-12-759

Koo, M., Norman, C.D., & Hsiao-Mei, C. (2012). Psychometric evaluation of a Chinese version of the eHealth literacy scale (eHEALS) in school age children. *Global Journal of Health Education and Promotion*, (1), 15-15. http://bit.ly/38QLmTe Korhan, O., & Ersoy, M. (2016). Usability and functionality factors of the social network site application users from the perspective of uses and gratification theory. *Quality & Quantity*, *50*(4), 1799-1816. https://doi.org/10.1007/s11135-015-0236-7

Kwan, G., Shaw, J.A., & Murnane, L. (2019). Internet usage within healthcare: How college students use the Internet to obtain health information. *Journal of Consumer Health on the Internet*, *23*(4), 366-377. https://doi.org/10.1080/15398285.2019.1681247

Lam, M.K., & Lam, L.T. (2012). Health information-seeking behaviour on the Internet and health literacy among older Australians. *Electronic Journal of Health Informatics*, *15*(2), 1-7. http://bit.ly/39ZLzVz

Lee, S.Y., & Hawkins, R. (2010). Why do patients seek an alternative channel? The effects of unmet needs on patients' health-related Internet use. *Journal of Health Communication*, *15*(2), 152-166. https://doi.org/10.1080/10810730903528033

Lemola, S., Perkinson-Gloor, N., Brand, S., Dewald-Kaufmann, J.F., & Grob, A. (2015). Adolescents' electronic media use at night, sleep disturbance, and depressive symptoms in the smartphone age. *Journal of Youth and Adolescence*, *44*(2), 405-418. https://doi.org/10.1007/s10964-014-0176-x

Liang, H., Xue, Y., & Chase, S.K. (2011). Online health information seeking by people with physical disabilities due to neurological conditions. *International Journal of Medical Informatics*, *80*(11), 745-753. https://doi.org/10.1016/j.ijmedinf.2011.08.003

Madathil, K.C., Rivera-Rodriguez, A.J., Greenstein, J.S., & Gramopadhye, A.K. (2015). Healthcare information on YouTube: A systematic review. *Health Informatics Journal*, *21*(3), 173-194. https://doi.org/10.1177/1460458213512220

Mamman, M., Ogunbado, A.F., & Abu-Bakr, A.S. (2016). Factors influencing customer's behavioral intention to adopt Islamic banking in northern Nigeria: Aproposed framework. *IOSR Journal of Economics and Finance*, *7*(1), 51-55. http://bit.ly/3bd5ssb

Mangan, D. (2015). Why Americans are putting off doctor visits: ZocDoc. https://cnb.cx/39fzZEH

Marshall, L.A., & Williams, D. (2006). Health information: does quality count for the consumer? How consumers evaluate the quality of health information materials across a variety of media. *Journal of Librarianship and Information Science*, *38*(3), 141-156. https://doi.org/10.1177/0961000606066575

Mathi, S. (2019). The Economics Behind India's Super-Cheap ($0.26 Per GB) Mobile Data. http://bit.ly/394rCLO

Metzger, M.J. (2007). Making sense of credibility on the Web: Models for evaluating online information and recommendations for future research. *Journal of the American Society for Information Science and Technology*, *58*(13), 2078-2091. https://doi.org/10.1002/asi.20672

Mitchell, S.J., Godoy, L., Shabazz, K., & Horn, I.B. (2014). Internet and mobile technology use among urban African American parents: Survey study of a clinical population. *Journal of Medical Internet Research*, *16*(1), 9. https://doi.org/10.2196/jmir.2673

Neter, E., & Brainin, E. (2012). eHealth literacy: extending the digital divide to the realm of health information. *Journal of Medical Internet Research*, *14*(1), e19-e19. https://doi.org/10.2196/jmir.1619

Norman, C.D., & Skinner, H.A. (2006). eHEALS: the eHealth literacy scale. *Journal of Medical Internet Research*, *8*(4), 27. https://doi.org/10.2196/jmir.8.4.e27

Pasupathi, M., Staudinger, U.M., & Baltes, P.B. (2001). Seeds of wisdom: Adolescents' knowledge and judgment about difficult life problems. *Developmental Psychology*, *37*(3), 351-361. https://doi.org/10.1037/0012-1649.37.3.351

Peng, W., Kanthawala, S., Yuan, S., & Hussain, S.A. (2016). A qualitative study of user perceptions of mobile health apps. *BMC Public Health*, *16*. https://doi.org/10.1186/s12889-016-3808-0

Rajpal, S., Kumar, A., & Joe, W. (2014). Economic burden of cancer in India: Evidence from cross-sectional nationally representative household survey. *PloS One*, *13*(2), 1-17. https://doi.org/10.1371/journal.pone.0193320

So, I.T., Lee, Y.J., Jung, H.I., Hwang, J.S., & Jang, B.K. (2019). The quality of non-alcoholic fatty liver disease information resources for patients on the Internet in Korea. *The KoreanJournal of Internal Medicine*, (pp. 1-11). https://doi.org/10.3904/kjim.2018.359

Spence, P.R., Lachlan, K.A., Westerman, D., & Spates, S.A. (2013). Where the gates matter less: Ethnicity and perceived source credibility in social media health messages. *Howard Journal of Communications*, *24*(1), 1-16. https://doi.org/10.1080/10646175.2013.748593

Vargo, C., Cole, R., & Minooie, M. (2014). The emerging papyrus society. Digital communication in the time of disclosure. http://bit.ly/2WjjgNO

Walsh-Childers, K. (2016). *Mass media and health: examining media impact on individuals and the health environment*. Routledge. https://doi.org/10.4324/9781315683683

Wartella, E., Rideout, V., Montague, H., Beaudoin-Ryan, L., & Lauricella, A. (2016). Teens, health and technology: A national survey. *Media and Communication*, *4*(3), 13-13. https://doi.org/10.17645/mac.v4i3.515

Yan, Y.Y. (2010). Online health information seeking behavior in Hong Kong: An exploratory study. *Journal of Medical Systems*, *34*(2), 147-153. https://doi.org/10.1007/s10916-008-9226-9

Sharenting: Internet addiction, self-control and online photos of underage children
Sharenting: Adicción a Internet, autocontrol y fotografías online de menores

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ABSTRACT

Sharenting is becoming a regular practice that compromises children's safety and privacy. This phenomenon is related to the act of sharing images of underage children on the Internet by their relatives. At the same time, a concern arises about the levels of Internet addiction in the population. In turn, levels of Internet addiction are a current problem in modern societies that has been linked to low self-control. This paper aims to analyse the degree to which images are published and the reasons why the adult segment of the population practices sharenting, to determine the socio-demographic factors that have an impact on sharenting, Internet addiction and self-control, and to establish the correlations between these three variables. A total of 367 Spanish adults aged between 18 and 61 (M=28.98; SD=10.47) completed an online survey. Both the multiple regression analysis and the structural equation modelling revealed that: 1) Age emerges as a predictor of Internet addiction; 2) Age, gender and employment status are predictors of low self-control; 3) No socio-demographic factors were found to be predictors of sharenting; 4) The only significant correlation was observed between Internet addiction and self-control. Finally, practical implications of this paper on the protection of minors and adults' need for information on Internet security are discussed.

RESUMEN

El sharenting se está convirtiendo en una práctica habitual que pone en riesgo la seguridad y privacidad de los niños. Este fenómeno responde al acto de compartir imágenes de menores de edad en Internet por parte de los familiares. A su vez, los niveles de adicción a Internet son una problemática actual en las sociedades modernas que ha empezado a vincularse con tener un bajo autocontrol. El objetivo de este estudio fue analizar el grado de publicación de imágenes y los motivos para realizar sharenting por parte de la población adulta, determinar los factores sociodemográficos que influyen en el sharenting, la adicción a Internet y autocontrol y establecer las correlaciones generadas entre estas tres variables. Participaron en la encuesta en línea un total de 367 adultos españoles entre 18 y 61 años (M=28,98; SD=10,47). Los análisis de regresión múltiple y el modelado de ecuaciones estructurales revelaron que: 1) La edad se alza como un predictor de la adicción a Internet; 2) La edad, género y situación laboral son predictores de un bajo autocontrol; 3) No se hallaron factores sociodemográficos que sean predictores del sharenting; 4) La única correlación significativa se estableció entre la adicción a Internet y el autocontrol. Finalmente, se discuten las implicaciones prácticas de este trabajo sobre la protección del menor y la necesidad de formación que tienen los adultos sobre seguridad en Internet.

KEYWORDS | PALABRAS CLAVE

Sharenting, children exposure, online privacy, cybersecurity, digital competence, Internet addiction, self-control, risk behaviour.
Sharenting, exposición de los niños, privacidad en línea, ciberseguridad, competencia digital, adicción a Internet, autocontrol, conductas de riesgo.

1. Introduction

The progress of Information and Communication Technologies (ICT) has directly affected citizens by promoting and improving access to electronic devices. This has facilitated the drastic increase in the use of devices in recent years. This consumption has grown at a frenzied pace in Spain, the country with the most smartphones per inhabitant in the world in 2016 (Europa Press, 2017). The most recent studies indicate that 93% of Spaniards have an Internet connection (Hootsuite, 2019). Considering these figures, it is not surprising to know that Spain is one of the European countries whose population is most at risk of suffering from Internet addiction (Díaz-Aguado et al, 2018). Therefore, this issue has become so significant within Spanish society that the country's Government has included this addiction to technology in its Action Plan on Addictions 2018-2020 (Ministry of Health, Consumption and Social Welfare, 2018). Internet addiction has been catalogued as a behavioural addiction (Balhara, 2018), directly linked to loss of control over one's own behaviour (Mann et al., 2017). This lack of self-control has an impact on the user's daily routine, while hindering the development of a satisfactory personal and professional life (Lowe & Haws, 2019).

In contrast, Internet addiction increases the likelihood of carrying out risky online behaviours, such as sharenting (Ouvrein & Verswijvel, 2019). A segment of the population has started to share pictures of underage relatives on their social networks, an action that is generating certain privacy conflicts related to the minor's image protection. Hence, this paper intends to carry out an analysis on the sharenting phenomenon in Spanish adults. It was also of interest to determine the influence between Internet addiction, sharenting and self-control.

2. Literature review

As social networks have been consolidated, excessive use of the Internet has skyrocketed (Malo-Cerrato et al., 2018). This is caused by impulsiveness and the need to be connected at all times to know what is happening on social media. Moreover, the exchange of information through the most popular social media platforms (Facebook, YouTube, Instagram, WhatsApp…) takes place in the form of audio-visual content posts (Xu et al., 2019). Nevertheless, these social networks are being used as channels to self-express and share typical images of family life (Dhir et al., 2017). In fact, some parents share images of their children through their blogs (Blum-Ross & Livingstone, 2017), Instagram (Choi & Lewallen, 2018), Facebook (Marasli et al., 2016) and Twitter (Otero, 2017). More specifically, the term sharenting stems from the words "share" and "parenting", and it relates to sharing images of the youngsters in the family (frequently underage) by parents or relatives (Çimke et al., 2018). This practice has begun to multiply on social networks, where it is common to find images of this kind.

A study prepared by the company McAfee in 2018 showed that 30% of parents were uploading a picture of their children to the Internet every day (Davis, 2018). This fact reveals a growing current issue, and the paramount need to analyse the causes and motivations for these actions. Some authors remark that pride and family affection towards the child are some of the reasons to publish images of underage children (Kopecký et al., 2020; Lazard et al., 2019); that is, an intrinsic necessity generated by emotional variables leads the user to wish to share that moment with their contacts. Nonetheless, sharenting creates a digital fingerprint that lasts a lifetime. Furthermore, this results in privacy issues related to the interest of minors' data protection (Büscher & Eberlin, 2017). It is also noteworthy that relatives often compromise children's privacy by exposing them to the public view without their consent (Brosch, 2016).

The majority of these issues arise from the content of pictures published showing minors that are naked or semi-naked, in swimwear or in situations where sensitive information is exposed (Choi & Lewallen, 2018). This has generated feelings of frustration and/or shame in pre-adolescents due to the type of content that their relatives are posting about them (Lipu & Siibak, 2019). This digital awkwardness may influence one's self-esteem and the development of a personal identity (Ouvrein & Verswijvel, 2019). In addition, the minor's identity is at risk of being stolen, and these images may end up being shared on sites promoting paedophilia (Otero, 2017).

Hence, sharenting is one of the causes produced by the lack of information and training on the use of networks and, in particular, on online privacy and security (Kopecký & Szotkowski, 2018). Despite the

efforts of the European Union and Spain towards digital literacy and digital competence development, the safety area is at its lowest levels (Aguaded et al., 2015; Cortina et al., 2014; Martínez & Rodríguez-García, 2018; Prendes et al., 2018). Some previous works have broadly studied the relationship between Internet addiction and self-control, which establishes a link between Internet abuse and a low level of self-control (Dumbar et al., 2017; Kim et al., 2017; Hatami et al., 2019; Oliva et al., 2019; Shirinkam et al., 2016; Song & Park, 2019; Yeun & Han, 2016). Nonetheless, no studies have been carried out linking sharenting to Internet addiction and self-control, which makes this paper a pioneering piece of research.

3. Method

A quantitative methodological approach was used to find answers to the aims of this study and the research questions raised. This allowed the numerical assessment of each variable in participants. The variables of analysis of this study are sharenting, Internet addiction and self-control.

3.1. Objectives and research questions

As a subject of study, this paper aims to: 1) Analyse the level of image publication and the reasons why the adult population in Spain engages in sharenting; 2) Determine the socio-demographic factors that have an impact on sharenting, Internet addiction and self-control; 3) Establish the correlations generated between sharenting, Internet addiction and self-control. The following research questions were addressed:

- RQ1: What type of images do Spanish adults share online?
- RQ2: What are the main reasons for sharenting?
- RQ3: Do adults consider the minor's right to privacy?
- RQ4: Do gender, age, level of studies, or employment status have an impact on sharenting, Internet addiction and self-control?
- RQ5: Is there a statistically significant correlation between sharenting, Internet addiction and self-control?

3.2. Participants and procedure

A cross-sectional study design was adopted based on the implementation of an online survey distributed through Facebook, Instagram and WhatsApp to the adult population in all regions of Spain. Research was conducted based on a convenience sampling design. Finally, the sample of this study was comprised of 367 Spanish adults.

Table 1. Socio-demographic data		
	n	**%**
Gender		
Male	123	33.5
Female	244	66.5
Age		
18-21	85	23.2
22-25	106	28.9
26-29	75	20.4
30 or more	101	27.5
Studies		
Secondary Education	13	3.5
A-Levels	108	29.4
High-level Vocational Training	27	7.4
University Degree	78	21.3
Master's Degree (posgraduate studies)	120	32.7
PhD	21	5.7
Employment situation		
Active	136	37.1
Inactive	231	62.9
Sharing pictures		
Yes	107	29.2
No	260	70.8

Before answering the scale, participants gave their informed consent. Information was also provided to all respondents about the purpose of the study and the anonymous processing of their data. Participants answered questions related to their socio-demographic data and three scales, one on topics connected to sharenting and two standardised instruments that measured Internet addiction and self-control. The survey offered a filter question which asked whether they published images of underage relatives online. This served to classify participants in two groups: sharenting and non-sharenting. The sharenting group consisted of 107 adults in total, and the non-sharenting group was comprised of 260 adults. Data was collected during June 2019. Table 1 shows participants' socio-demographic data. In total the sample consisted of 123 men and 244 women aged between 18 and 61 (M=28.98; SD=10.47).

3.3. Measures
3.3.1. Sharenting Scale
A scale was prepared to analyse the topics related to sharenting (Çimke et al., 2018; Lipu & Siibak, 2019; Marasli et al., 2016). The scale measured the frequency of picture publication, platforms used, motivations and privacy using eight items. Answers were grouped into multiple choice and dichotomic options (yes/no). The scores of the scale ranged from 6 to 18 points, where the highest score was related to a problematic intensive use of sharenting. This sample had good reliability (Cronbach's α=.88).

3.3.2. Internet Addiction Test (IAT-SV)
The instrument par excellence to quantify Internet addiction is the Internet Addiction Test (IAT) (Young, 1998). The short version of this instrument assesses Internet addiction through answers to 12 items. This is a 5-point Likert scale, where 1 is never and 5 is always. Participants answered according to their frequency of use. The scores of the scale ranged from 12 to 60 points, where the highest score is related to a highest level of Internet addiction. The IAT-SV reflects adequate psychometric properties (Pawlikowski et al., 2013) and has been validated in the Spanish context (Puerta et al., 2012). This sample had good reliability (Cronbach's α=.86).

3.3.3. Brief Self-Control Scale (BSCS-SV)
Self-control was calculated through the BSCS short version. This instrument assesses self-control from answers to 13 items. Participants indicated their level of agreement with each item using a 5-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). The scale yields scores ranging from 13 to 65 points. The higher the score, the lower the self-control. The BSCS-SV registers good psychometric properties and internal consistency (Tangney et al., 2004). Furthermore, it has been validated in a Spanish sample (Del-Valle et al., 2019). This sample has good reliability (Cronbach's α=.89).

3.4. Data analysis
Data analysis was carried out using different statistical tests according to the aims and questions of the study. First, the frequencies of the sharenting scale were calculated to find out relevant matters related to minor relatives, the frequency of picture publication, the platforms used, the motivations and their perception of privacy. In addition, the statistical descriptive values (mean, standard deviation, skewness and kurtosis in the elements that compose the scales) were calculated to verify the multivariate normality of data. At the same time, the Kolmogorov-Smirnov normality test with Lilliefors significance correction was also performed to confirm the normality hypothesis (Pedrosa et al., 2015). This is an indispensable condition to establish a structural equation model (SEM) (Curran et al., 1996).

Moreover, the differences between groups were analysed through the t-test for the comparison of two populations and the Chi-square test for the comparison of more than two populations. These statistical tools were aimed at verifying whether there were significant differences between the groups based on gender, age, studies, employment status and sharenting. Then the significance of each independent variable in the three scales was verified through the multiple linear regression model. To this end, dichotomous variables were converted into dummy variables.

Correlations were calculated to test the SEM hypothetical model (Figure 1). Sharenting, Internet addiction and self-control were the latent variables. The factors of each scale were the observed variables:

two factors in internet addiction, three factors in sharenting and three factors in self-control. Data were analysed by means of the statistical programme IBM SPSS and IBM SPSS Amos, version 24.

Figure 1. Hypothesized model
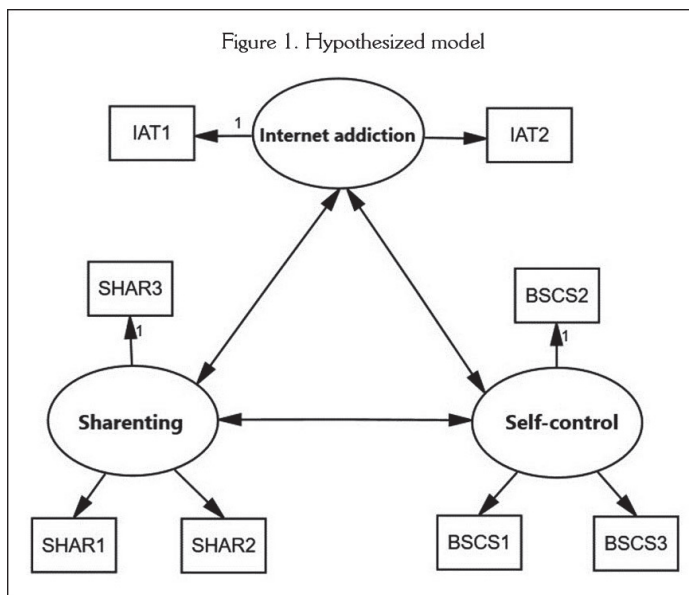
4. Results

The study's sample reported engaging in sharenting at an annual (50.5%) and monthly (32.7%) frequency of image publication. To a lesser extent, participants reported sharing images: weekly (15%) and daily (1.9%). In terms of the number of pictures posted, fewer than 10 pictures uploaded to networks (60.7%), between 10-20 pictures (21.5%), between 21-30 pictures (9.3%), between 31-40 (.9%), between 41-50 pictures (2.8%) and more than 50 pictures (4.7%). In relation to the connection to the minor relative, it is most often a cousin (46.72%) or a younger brother / sister (30.84%). Images of nephews / nieces (25.23%) and sons / daughters (19.62%) were also mentioned. The ages ranged between 0 and 17 years (M=9.28; SD=5.09). These images are shared on different web platforms, with WhatsApp (81.5%), Instagram (57.4%) and Facebook (34.3%) prevailing. Other platforms used are Twitter (3.7%), Telegram (1.9%) and personal web sites (.9%).

Concerning privacy, the majority of adults stated that they had the minor's permission (55.1%). In spite of this, they believed that it was not appropriate to share the pictures (53.3%). Furthermore, 63.6% thought that uploading pictures of a minor to the Internet did not lead to the minor's privacy being invaded, and 53.3% stated that this practice is not risky for the underage child. Among the reasons to share pictures on social media, we have found: sharing family moments (77.8%); the picture is really funny (48.1%); intention to keep that memory online (25%); a desire to make the child known (16.7%); and showing off for contacts (13%).

Some differences were observed in the scores obtained from the independent variables on each scale (Table 2). These differences are significant for the groups of 18-21 and 26-29 year olds in IAT (p=.009) and BSCS (p=.029), 18-21 and 30 year-olds or older in IAT (p=.000) and BSCS (p=.001); 22-25 and 26-29 year-olds in BSCS (p=.024); 22-25 and 30 year-olds or older in IAT (p=.002) and BSCS (p=.001), and 26-29 and 30 years or older in IAT (p=.024). The level of studies completed of A-Levels (Spanish Baccalaureate) and High Level of Vocational Training in IAT (p=.014), A-Levels (Spanish Baccalaureate) and University Degree in IAT (p=.035), A-Levels (Spanish Baccalaureate) y Master's Degree in IAT (p=.001) and BSCS (p=.011), A-Levels (Spanish Baccalaureate) and PhD in IAT (p=.031). Employment status in IAT (p=.000) and BSCS (p=.000). No significant differences were found among the independent variables regarding sharenting.

Table 2. Descriptive statistics of the independent variables in the different scales						
	Sharenting		IAT		BSCS	
	M	SD	M	SD	M	SD
Gender						
Male	11.94	1.652	24.05	8.476	36.20	5.945
Female	11.04	1.706	24.38	7.721	35.60	5.187
Age						
18-21	10.88	1.661	27.01	7.965	36.82	4.716
22-25	10.87	1.548	24.99	8.105	36.98	5.720
26-29	11.32	1.376	23.99	6.377	35.11	5.108
30 or more	11.81	2.079	21.42	8.064	34.21	5.581
Studies						
Secondary Education	9.67	1.528	24.38	8.262	34.38	5.966
A-Levels	10.84	1.555	26.58	8.133	37.02	5.574
High-level Vocational Training	11.86	1.345	22.37	6.404	34.67	5.974
University Degree	11.52	2.233	23.94	8.766	35.90	5.263
Master's Degree	11.27	1.639	23.13	7.476	35.18	5.271
PhD	11.43	.976	22.48	6.408	35.00	4.899
Employment situation						
Active	11.56	2.015	22.27	8.360	34.37	5.772
Inactive	11.01	1.564	25.45	7.507	36.64	5.082
Sharing pictures						
Yes	--	--	24.59	8.885	36.36	5.784
No	--	--	24.14	7.579	35.57	5.304

The multiple linear regression analysis (Table 3) shows that the model of Internet addiction has good adjustment and is significant (F-statistic=5.736; p=.000), as well as the self-control model (F-statistic=5.274; p=.000). Nevertheless, the sharenting model is not significant (F-statistic=2.141; p=.081). In the model of Internet addiction, the significant independent variable is age (p=.002), unlike the model of self-control, whose significant variables are gender (p=.050), age (p=.016) and employment status (p=.016). Sharenting has no significant independent variable.

| Table 3. Multiple linear regression analysis							
	Independent variable	B	SE	T	β	p	R^2
Sharenting	Gender	-.80	.461	-1.754	-.16	.083	.07
	Age	.24	.185	1.334	.16	.185	
	Studies	.04	.144	.282	.03	.778	
	Employment situation	-.14	.407	-.346	-.03	.730	
Internet addiction	Gender	-.33	.890	-.371	-.02	.711	.07
	Age	-1.35	.432	-3.147	-.19**	.002	
	Studies	-.27	.319	-.872	-.05	.384	
	Employment situation	1.49	.954	1.566	.09	.118	
	Sharing pictures	-.04	.920	-.045	-.00	.964	
Self-control	Gender	-1.19	.610	-1.955	-.10*	.050	.06
	Age	-.71	.296	-2.419	-.14**	.016	
	Studies	.01	.219	.050	.00	.960	
	Employment situation	1.59	.655	2.429	.14**	.016	
	Sharing pictures	-.77	.631	-1.235	-.06	.218	

Note. *p < .05; **p < .01; ***p < .001.

In order to set the SEM, the hypothesis of multivariate normality was met, given that the skewness had values below two, and kurtosis below seven (Curran et al., 1996) (Table 4). Kolmogorov-Smirnov Test obtained values that confirmed this hypothesis for sharenting (K-S=.142, df=107; p=.072), Internet addiction (K-S=.089, df=107; p=.067) and self-control (K-S=.085, df=107; p=.054) (Pedrosa et al., 2015).

Table 4. Descriptive statistics of latent variables				
	M	SD	Skewness	Kurtosis
Sharenting	11.18	1.720	.207	.088
Internet addiction	24.27	7.972	.777	.592
Self-control	35.80	5.452	.197	.044

The goodness-of-fit indexes for SEM are normal and confirm the adequacy of data (Figure 2): the root mean squared error of approximation (RMSEA=.017); the goodness-of-fit index (GFI=.960); the root mean residual index (RMR=.038); the Tucker-Lewis index (TLI=.990); the parsimony goodness-of-fit index (PGFI=.697), and the comparative fit index (CFI=.994).

Figure 2. Estimations of the structural equation model
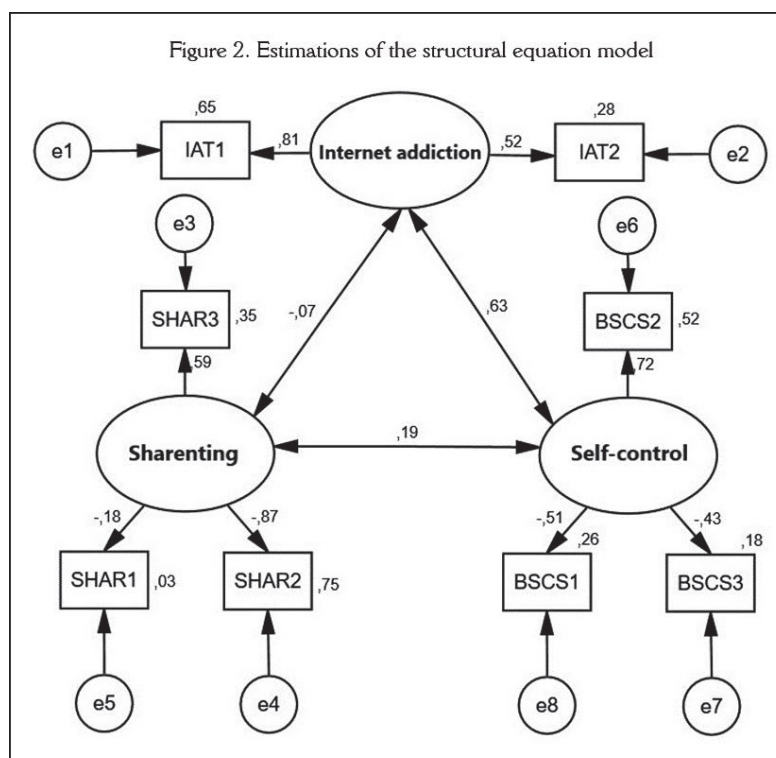
Note. Chi-square=17.551; df=17; p=.000.

Estimations of the structural equation model reveal the positive and significant correlation between Internet addiction and self-control (R=.626; p=***), the positive correlation between self-control and sharenting (R=.186) and the negative correlation between sharenting and Internet addiction (R=-.069) (Table 5).

Table 5. Parameter estimates of final model					
Correlation	Cov	SE	CR	p	R
Internet addiction ↔ Self-control	.488	.135	3.608	***	.626
Sharenting ↔ Internet addiction	-.020	.040	-.511	.610	-.069
Self-control ↔ Sharenting	.040	.036	1.127	.260	.186

Note. CR=critical radio; ***p < .001.

5. Discussion and conclusions

The results obtained are similar to the McAfee study in terms of sharenting frequency, in which nearly 30% of the sample engages in this practice (Davis, 2018). Moreover, the data reveal a common use of social networks to share images of underage relatives. Internet addiction and self-control are directly related and show a certain impact on sharenting.

In particular, data on sharenting suggest that the underage children affected by their relatives publishing images are usually cousins or the younger siblings, followed by sons / daughters and nephews / nieces, though at a lower percentage. Hence, it is not only underage sons / daughters who are affected nowadays, as per traditional sharenting (Çimke et al., 2018). This enables new perspectives in the study of sharenting, where there are cases that go beyond the publication of images by parents depicting their children. This online image publication is carried out to a larger extent on a monthly or annual basis. Relatives upload

an average of fewer than 10 pictures to networks. Nonetheless, almost 5% of them published more than 50 pictures. This is related to the problematic use of social networks, which compromises the minor's privacy and security. The preferred platforms to share pictures are social media (Malo-Cerrato et al., 2018). Particularly, WhatsApp leads the ranking well above the rest. Even so, the results show other social networks linked to this kind of practice, like Instagram, Facebook, Twitter and Telegram. The differences in the use of social networks are a result of the trend in their use, where in recent years, Instagram has experienced a boom in the number of users who share images of children on the network (Choi & Lewallen, 2018). Although, according to the data obtained in the study, Facebook continues to be one of the preferred social networks for parents to share photos (Marasli et al., 2016). To a lesser extent, Twitter and Telegram are used for this purpose. In particular, Twitter is one of the least used despite the boom it had a few years ago. The influx of other social networks has conditioned the specialization of Twitter in other types of content and public. So, based on the data in this study, Twitter is not usually used to share pictures of underage relatives, which contrasts with data collected in previous studies (Otero, 2017).

Concerning privacy, more than half of adults' remark that they have the child's permission to upload pictures. The other half (nearly 50%) has not received the minor's permission (Brosch, 2016). This is linked to the main issues on sharenting: the publication of images regardless of the repercussions for the minor. To this regard, the adult respondents share these kinds of pictures even though most of them deem it inappropriate to share images of the underage online. In addition, they strongly believe that they are not invading the child's privacy, which goes against children's data protection law (Büscher & Eberlin, 2017).

This has an impact on the idea that sharenting implies no risks for minors. In this sense, adults usually ignore the other's perspective, since pictures have sensitive information that may generate feelings of shame and frustration in the affected individuals (Choi & Lewallen, 2018; Lipu & Siibak, 2019; Ouvrein & Verswijvel, 2019). Furthermore, it is necessary to consider the risk caused by the mass publication of pictures, which facilitates the theft of images or, even worse, the minor's identity being stolen by cybercriminals (Otero, 2017). This creates an added issue to the problem of sharenting, since adults are not aware of the real risks of sharing photos on the Internet. This is compounded by the fact that photos are forwarded between contacts, which increases the dissemination of images. In particular cases, these images can become viral or become memes, with the image of the child becoming an object of joke and/or mockery.

It is a linear fact that the uncontrolled publication of images of underage relatives on the Internet is linked to adults' disinformation about digital security (Kopecký & Szotkowski, 2018). Data showed that the Spanish adults surveyed are not aware of the risks implied in this kind of practice for the minor's safety. This case study is related to the data from Spanish studies indicating the low acquisition level for this digital competence (Aguaded et al., 2015; Cortina et al., 2014; Martínez & Rodríguez-García, 2018; Prendes et al., 2018). The training of adults in digital matters is fundamental to the problem of sharenting, an aspect that should be stressed in order to reduce the publication of images of minors without control or consent on the part of the child.

Among the reasons given by participants for sharing these images online, what stands out is the desire to share family moments, and the fact that the picture is funny. In spite of the need for self-expression not being new, this has increased on social media, given that it reaches a greater audience (Dhir et al., 2017). Hence, personal emotions emerge, such as pride towards the underage relative, the expression of which is materialised through sharing their image with contacts on social networks (Kopecký et al., 2020; Lazard et al., 2019). This possibility of expressing a feeling with other contacts is one of the incentives of sharenting, there are even cases where adults use the photographs of the child for their own economic benefit (child YouTuber cases) and even sentimental (if they are used to flirt with or harm a former partner).

Statistically significant differences were found in Internet addiction and self-control according to age. The range of 18-21 years of age is the one which presents a higher rate of Internet addiction (Díaz-Aguado et al., 2018). It extends to 25 years old for self-control, where the population aged 18-25 shows lower self-control. Data reflect a remarkable inversely proportional relationship between age and Internet addiction. This link between age, Internet addiction and self-control was confirmed in the multiple linear regression

model, which indicates that age is a predictor of Internet addiction and self-control. The level of studies also had an impact on Internet addiction and self-control, with significant differences between groups. The participants that completed up to A-Levels (Spanish Baccalaureate) are more likely to have higher Internet addiction and lower self-control. We found a tendency that suggests that the higher the level of studies of the population, the lower the rate of Internet addiction and the higher the self-control.

Employment status is also an indicator of Internet addiction and self-control. Significant differences were found between active and inactive participants. Inactive individuals received higher scores in terms of Internet addiction and lower self-control. Furthermore, employment status was a predictor of self-control, then significantly saturating the linear regression model together with age and gender.

Nonetheless, no significant differences were found in relation to Internet addiction and self-control within the population that does sharenting and the one that does not, even though the scores of the sharenting group are higher on both scales. Thus, there are indications that sharenting can be linked to Internet addiction and self-control. However, in this study the data have not confirmed these premises. No socio-demographic predictive factors for sharenting were established with the linear regression model. So, a priori, sharenting can be found equally in all sectors of the population without being influenced by gender, age, educational level or employment status.

Finally, the SEM calculated the correlations between the study variables. The only significant correlation was observed between Internet addiction and self-control, which is positive. In this sense, the higher the Internet addiction, the higher the scores on the BSCS scale, which indicates that self-control is lower (Dumbar et al., 2017; Kim et al., 2017; Hatami et al., 2019; Mann et al., 2017; Oliva et al., 2019; Shirinkam et al., 2016; Song & Park, 2019; Yeun & Han, 2016).

The other correlations, despite not being significant, registered the positive correlation between self-control and sharenting. Hence, a link could be established between the possibility of lower self-control being an indicator of sharing images of underage relatives online, as well as the negative correlation between sharenting and Internet addiction. A priori, Internet addiction was not linked to the uploading of these kinds of pictures online, even if the likelihood of sharenting is potentially higher in the population with Internet addiction as previous studies indicate (Ouvrein & Verswijvel, 2019).

In summary, sharing images of relatives with other individuals has been a common practice since the origins of photography. Nevertheless, the ways chosen to show those pictures to the people close to us has been evolving in recent years. We have gone from sharing that special image in person, often kept in our wallet, to sharing it digitally through social networks to a vastly larger and unknown audience.

The study answered the aims and questions herein stated. Relevant information has been gathered on the level of image publication by the surveyed Spanish adults. In addition, certain socio-demographic factors that have an effect on Internet addiction and self-control were determined, and the correlations between the three study variables were calculated.

The practical contributions of this paper include the need to generate informative literature for adults on Internet security, and the risks associated with practices like sharenting. The findings obtained may be used in education centres to teach younger students about the appropriate use of technology. Certain measures should be established in higher education levels, where the age group that is most likely to suffer from Internet addiction is concentrated, in order to help mitigate this issue. For example, the dissemination of information posters and training focused on the good use of technology.

The sample size was one of the limitations of this paper. It would be ideal for future studies to increase the sample to verify whether the data change or remain steady. The number of socio-demographic factors explored should be increased as well, considering that they are limited. It is advisable that future papers widen the number of independent variables to verify whether there are others that work as predictors of sharenting, Internet addiction or self-control. Furthermore, it would be interesting for future studies to address the forwarding of photographs of minors from contacts and also the forwarding of viral images or memes containing the image of a minor.

In conclusion, this paper is completely in line with studies on sharenting. Yet, what distinguishes it is the expansion of research. It is one of the first studies addressing sharenting from a quantitative viewpoint and relating this phenomenon to other variables in a wide sample of participants.

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References

Aguaded, I., Tirado-Morueta, R., & Ángel Hernando-Gómez (2015). Media competence in adult citizens in Andalusia, Spain. *Information, Communication & Society*, *18*, 659-679. https://doi.org/10.1080/1369118x.2014.985244

Altan, P., Polat, S., & Yildirim, G.E. (2018). Strengthening the implementation of the FCTC with a special focus to youth. *Tobacco Induced Diseases*, *16*, 261-267. https://doi.org/10.18332/tid/84501

Balhara, Y.P.S. (2018). Behavioural addictions: Need to correct misnomers. *Asian Journal of Psychiatry*, *36*, 118-118. https://doi.org/10.1016/j.ajp.2018.07.014

Blum-Ross, A., & Livingstone, S. (2017). "Sharenting," parent blogging, and the boundaries of the digital self. *Popular Communication*, *15*(2), 110-125. https://doi.org/10.1080/15405702.2016.1223300

Brosch, A. (2016). When the child is born into the internet: Sharenting as a growing trend among parents on facebook. *The New Educational Review*, *43*, 225-235. https://doi.org/10.15804/tner.2016.43.1.19

Büscher, F., & Eberlin, T. (2017). Sharenting, freedom of expression and children's privacy in the digital environment: The role of application providers under the Brazilian legal framework. *Brazilian Journal of Public Policy*, *7*(3), 255-273. https://doi.org/10.5102/rbpp.v7i3.4821

Choi, G.Y., & Lewallen, J. (2018). "Say Instagram, Kids!": Examining sharenting and children's digital representations on Instagram. *Howard Journal of Communications*, *29*(2), 144-164. https://doi.org/10.1080/10646175.2017.1327380

Cortina-Pérez, B., Gallardo-Vigil, M.A., Ángeles Jiménez-Jiménez, M., & Trujillo-Torres, J.M. (2014). Digital illiteracy: A challenge for 21st century teachers. *Cultura y Educación*, *26*(2), 231-264. https://doi.org/10.1080/11356405.2014.935108

Curran, P.J., West, S.G., & Finch, J.F. (1996). The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods*, *1*(1), 16-29. https://doi.org/10.1037/1082-989x.1.1.16

Davis, G. (2018). *Should you post pics of your kids? Insights from our age of consent survey*. McAfee. https://bit.ly/2U0Jemi

Del-Valle, M., Galli, J.I., Urquijo, S., & Canet, L. (2019). Spanish adaptation of the Self-Control Scale and the Brief Self-Control Scale and evidences of validity in university population. *Revista Argentina de Ciencias del Comportamiento*, *11*(2), 52-64. https://doi.org/10.32348/1852.4206.v11.n2.23413

Dhir, A., Chen, G.M., & Chen, S. (2017). Why do we tag photographs on Facebook? Proposing a new gratifications scale. *New Media & Society*, *19*(4), 502-521. https://doi.org/10.1177/1461444815611062

Díaz-Aguado, M.J., Martín-Babarro, J., & Falcón, L. (2018). Problematic Internet use, maladaptive future time perspective and school context. *Psicothema*, *30*(2), 195-200. https://doi.org/10.7334/psicothema2017.282

Dunbar, D., Proeve, M., & Roberts, R. (2017). Problematic internet usage self-regulation dilemmas: Effects of presentation format on perceived value of behavior. *Computers in Human Behavior*, *70*, 453-459. https://doi.org/10.1016/j.chb.2017.01.015

Europa press (Ed.) (2017). España, el país con más 'smartphones' por habitante del mundo. https://bit.ly/2WEQnbm

Hatami, A., Badrani, M.R., Mohammadzadeh, H., & Kargar, M. (2019). Examining the relationship between addiction to social networks and social maturity of university students. *Journal of Research in Medical and Dental Science*, *7*(1), 14-19. https://bit.ly/2UtMZkt

Hootsuite (Ed.) (2019). Digital in 2019. https://bit.ly/2MNyJyO

Kim, J., Hong, H., Lee, J., & Hyun, M.H. (2017). Effects of time perspective and self-control on procrastination and Internet addiction. *Journal of Behavioral Addictions*, *6*(2), 229-236. https://doi.org/10.1556/2006.6.2017.017

Kopecký, K., & Szotkowski, R. (2018). *Parents and fatherhood in the digital age*. Olomouc.

Kopecky, K., Szotkowski, R., Aznar-Díaz, I., & Romero-Rodríguez, J.M. (2020). The phenomenon of sharenting and its risks in the online environment. Experiences from Czech Republic and Spain. *Children and Youth Services Review*, *110*, 104812. https://doi.org/10.1016/j.childyouth.2020.104812

Lazard, L., Capdevila, R., Dann, C., Locke, A., & Roper, S. (2019). Sharenting: Pride, affect and the day-to-day politics of digital mothering. *Social and Personality Psychology Compass*, *13*(4), e12443-e12443. https://doi.org/10.1111/spc3.12443

Lipu, M., & Siibak, A. (2019). 'Take it down!': Estonian parents' and pre-teens' opinions and experiences with sharenting. *Media International Australia*, *170*(1), 57-67. https://doi.org/10.1177/1329878x19828366

Lowe, M.L., & Haws, K.L. (2019). Confession and self-control: A prelude to repentance or relapse? *Journal of Personality and Social Psychology*, *116*(4), 563-581. https://doi.org/10.1037/pspi0000152

Malo-Cerrato, S., de-las Mercedes Martín-Perpiñá, M., & Viñas-Poch, F. (2018). Excessive use of social networks: Psychosocial profile of Spanish adolescents. [Uso excesivo de redes sociales: Perfil psicosocial de adolescentes españoles]. *Comunicar*, *56*, 101-110. https://doi.org/10.3916/c56-2018-10

Mann, K., Kiefer, F., Schellekens, A., & Dom, G. (2017). Behavioural addictions: Classification and consequences. *European Psychiatry*, *44*, 187-188. https://doi.org/10.1016/j.eurpsy.2017.04.008

Marasli, M., Suhendan, E., Yilmazturk, N.H., & Cok, F. (2016). Parents' shares on social networking sites about their children: Sharenting. *The Anthropologist*, *24*, 399-406. https://doi.org/10.1080/09720073.2016.11892031

Martínez, N., & Rodríguez-García, A.M. (2018). Literacy and digital competence in elderly people: The case of the open training classroom of University of Granada. *Espacios*, *39*(10). https://bit.ly/2UuMBDD

Ministry of Health, Consumption and Social Welfare (Ed.) (2018). Plan de Acción sobre Adicciones 2018-2020. https://bit.ly/2O44DWQ

Oliva, A., Antolín-Suárez, L., & Rodríguez-Meirinhos, A. (2019). Uncovering the link between self-control, age, and psychological maladjustment among Spanish adolescents and young adults. *Psychosocial Intervention*, *28*(1), 49-55. https://doi.org/10.5093/pi2019a1

Otero, P. (2017). Sharenting… should children's lives be disclosed on social media? *Arch Argent Pediatr*, *115*(5), 412-414. https://doi.org/10.5546/aap.2017.eng.412

Ouvrein, G., & Verswijvel, K. (2019). Sharenting: Parental adoration or public humiliation? A focus group study on adolescents' experiences with sharenting against the background of their own impression management. *Children and Youth Services Review*, *99*, 319-327. https://doi.org/10.1016/j.childyouth.2019.02.011

Pawlikowski, M., Altstötter-Gleich, C., & Brand, M. (2013). Validation and psychometric properties of a short version of Young's Internet Addiction Test. *Computers in Human Behavior*, *29*(3), 1212-1223. https://doi.org/10.1016/j.chb.2012.10.014

Pedrosa, I., Juarros-Basterretxea, J., Robles-Fernández, A., Basteiro, J., & García-Cueto, E. (2015). Goodness of fit tests for symmetric distributions, which statistical should i use? *Universitas Psychologica*, *14*(1), 245-254. https://doi.org/10.11144/Javeriana.upsy14-1.pbad

Prendes, M.P., Solano, I., Serrano, J.L., González, V., & Román, M.M. (2018). Personal learning environments to understand and develop digital competence: Analysis of university students in Spain. *Educatio Siglo XXI*, *36*(2), 115-134. https://doi.org/10.6018/j/333081

Puerta-Cortés, D.X., Carbonell, X., & Chamarro, A. (2012). Análisis de las propiedades psicométricas de la versión en español del Internet Addiction Test. *Trastornos Adictivos*, *14*, 99-104. https://doi.org/10.1016/s1575-0973(12)70052-1

Shirinkam, M.S., Shahsavarani, A.M., Toroghi, L.M., Mahmoodabadi, M., Mohammadi, A., & Sattari, K. (2016). Internet addiction antecendants: Self-control as a predictor. *International Journal of Medical Research & Health Sciences*, *5*(5), 143-151. https://bit.ly/2vJ3EIB

Song, W.J., & Park, J.W. (2019). The influence of stress on internet addiction: Mediating effects of self-control and mindfulness. *International Journal of Mental Health and Addiction*, *17*, 1063-1075. https://doi.org/10.1007/s11469-019-0051-9

Tangney, J.P., Baumeister, R.F., & Boone, A.L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, *72*(2), 271-324. https://doi.org/10.1111/j.0022-3506.2004.00263.x

Xu, L., Bao, T., Zhu, L., & Zhang, Y. (2019). Trust-based privacy-preserving photo sharing in online social networks. *IEEE Transactions on Multimedia*, *21*(3), 591-602. https://doi.org/10.1109/tmm.2018.2887019

Yeun, Y.R., & Han, S.J. (2016). Effects of psychosocial interventions for schoolaged children's internet addiction, self-control and self-esteem: Meta-Analysis. *Healthcare Informatics Research*, *22*(3), 217-217. https://doi.org/10.4258/hir.2016.22.3.217

Young, K.S. (1998). *Caught in the net: How to recognize the signs of Internet addiction – And a winning strategy for recovery*. John Wiley & Sons, Inc.

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InContext: A mobile application for the improvement of learning strategies at University

InContext: Una aplicación móvil para mejorar las estrategias de aprendizaje en la Universidad

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ABSTRACT

InContext is a custom-designed mobile application for writing assignments intended for university students in journalism and research methodology courses. In these disciplines, it has been observed that there is a need for an educational and technological tool to guide the writing of text using preloaded templates in which students can input text and multimedia material to create articles or write research reports. Besides its ease of use, the app was intended to improve metacognitive thinking. This led to the establishment of six working hypotheses in an exploratory study. For the study, a random sample of students enrolled in the aforementioned courses was selected during the August-December 2019 semester at a private university in Mexico. They took a pre-test using the "Motivated Strategies for Learning Questionnaire" (MSLQ) that had been translated into Spanish and already validated in Mexico. Subsequently, the students used the application and then answered the same questionnaire as a post-test. The study aimed to compare the results of the tests to see whether there was an improvement in cognitive skills. The results showed an increase in four skills: critical thinking, data search, cognitive self-regulation, and regulation of effort. The research results did indicate metacognitive development that would benefit the academic and professional work of future graduates.

RESUMEN

InContext es una aplicación móvil, diseñada a medida, para elaborar trabajos de redacción para estudiantes universitarios de los cursos de periodismo y de metodología de la investigación. En estas disciplinas se observó que había una necesidad de contar con una herramienta educativa y tecnológica que guiara la redacción utilizando plantillas precargadas en las cuales los estudiantes pudieran agregar texto y material multimedia para con ello construir artículos periodísticos o reportes de investigación. Además de la facilidad de uso, se esperaba que la app mejorara el pensamiento metacognitivo, por lo cual se establecieron seis hipótesis de trabajo en un estudio exploratorio. Para la investigación se seleccionó una muestra aleatoria de estudiantes inscritos en los cursos durante el semestre agosto-diciembre 2019 en una universidad privada de México. Los alumnos realizaron un pretest utilizando el cuestionario Motivated Strategies for Learning Questionnaire (MSLQ) traducido al español y ya validado en México; posteriormente utilizaron la aplicación y contestaron el mismo cuestionario a manera de postest, con el objetivo de comparar si había una mejora en las habilidades cognitivas. Los resultados indican que existe un aumento en cuatro habilidades: pensamiento crítico, búsqueda de datos, autorregulación cognitiva y regulación del esfuerzo, pero no lo hubo en organización ni en búsqueda de ayuda. Estos resultados indican un desarrollo metacognitivo que beneficia el trabajo académico y profesional de los futuros egresados.

KEYWORDS | PALABRAS CLAVE

Mobile application, journalism, research methodology, educational innovation, higher education, writing, pedagogical research, didactic proposal.
Aplicación móvil, periodismo, metodología de investigación, innovación educativa, enseñanza superior, redacción, investigación pedagógica, propuesta didáctica.

1. Introduction

Technological advances give university students a wide range of opportunities to develop their skills and apply conceptual knowledge to professional projects. This points to the possibility of using tools to progress in academic projects at their own pace and develop metacognitive skills that prepare them for the work environment. The core professional abilities needed include the ethical use of technology, knowledge of programming, writing on multiple platforms, use of mobile devices as work and communication tools, and audiovisual skills. Indeed, we emphasize that multimedia and digital skills occupy one of the most crucial positions among professional competencies (Lugo-Ortiz, 2016). Berger and Foote (2018) point out that in some educational fields, teaching does not meet the needs of the work environment, which results in companies or academic institutions not having assignments done on time or correctly.

Journalistic practices in the academic environment lead to students developing skills and becoming prepared for the possible challenges of professional life (Deuze, 2018). The same can be said about researchers who are confronting new ways to collect information. This is why academic-program-evaluation agencies, like the Accrediting Council on Education in Journalism and Mass Communications, have established the need to maintain a balance between the classroom and industry as a requirement for a university to obtain international academic accreditation (2019).

The speed of technological changes and the need for adaptation make it necessary to educate through various devices (Walck et al., 2015) in order to facilitate timely follow-up by academic mentors in education. For example, Martín-Serrano (2019) notes that many activities of daily life have been virtualized; that is, they are carried out through digital means and the use of the Internet. So, now, it is possible to say that the use of technologies is not just prevalent but that they can be harnessed in the educational field without removing human relationships.

Focusing on Mexico and data of the Internet Association (2018), we must point out the high percentage of mobile connections in this country (89%), which demonstrates the priority given to this medium. Therefore, this research paper reports on our work developing and using the mobile application called InContext, which was created for students taking journalism courses and learning research methodology at university level. This application has preloaded templates with input fields to put audiovisual and textual information so that the students have on hand all the data they need to write texts, such as articles, stories, opinion essays, etc., and all according to pre-established learning strategies. This research project was carried out in several stages that involved the design of the application, usability tests, and finally, the use of the application by students to assess whether it promoted the development of metacognitive skills.

2. State of the art

The heutagogic posture embraces the need for flexibility in learning, the use of resources, and the guidance a professor provides to his students, but with an emphasis on the student as the one to design his learning (Hase & Kenyon, 2000). This is a starting point for a student to develop a feeling for critical thinking and the skills to use resources creatively.

The use of technology in courses relates to heutagogy due to the need to promote students' critical analysis and their involvement as citizens, something that can only happen if the way in which people are helped to learn is changed (Hase & Kenyon, 2000). Therefore, the use of mobile applications that promote journalistic work can foster critical thinking, an aspect that Deuze (2018) points to as indispensable in triggering innovative spirit in the university.

Similarly, Ramos et al. (2009) urge educational institutions to introduce the use of mobile devices as a teaching-support strategy, emphasizing that their use does not in itself promote cognitive skills, but that these are developed when there is educational intent behind their introduction. Litwin points out that educational innovations must put actions into play that achieve improvements in teaching practices (Rodríguez & López, 2017). Also, Ajayi et al. (2019) state that the use of a mobile device has been a crucial element in the improvement in the quality of education at the professional level in Nigeria, and their work emphasizes the need for feedback between instructors and students.

Another context in which mobile technology has been useful was demonstrated by Mu and Paparas (2015) when they examined the use of clickers in the classroom to improve interest in economics courses

and reported how students connect to applications like Kahoot to participate in class. Also, Wakefield et al. (2018) associate the use of the electronic tablet to create collaborative learning environments with improvement in student performance and satisfaction. However, they point out that it is necessary to have analyses that consider how professors affect the learning environment, as well as how both professors and students use new technologies. On the other hand, the study by Laskin and Oats (2015) indicates that students at a private university in the United States did not visualize the possibility of using mobile technology in education because their professors had never assigned it.

Pauleen et al. (2015) report that technology facilitates work activities being done anywhere and at any time, but a disadvantage occurs when the work consumes the time for leisure or social interaction. Another disadvantage is mentioned by Carcelén et al. (2019), who note that some students use the mobile phone in the classroom abusively, so they conclude with an emphasis on its responsible use. Despite the disadvantages, most studies highlight that mobile technology is a vital tool for educational work. Castro and Ponce-de-León (2018) point out that teenagers are prone to use instant messaging, for example, for academic matters, although they mainly use this outside of the class.

As for graduate students, Anand et al. (2014) highlight the introduction of mobile technology (iPad) as a useful tool because it allows the management of communications, reading materials, and class notes. University students point to the Internet as necessary in the face of changes in the means of access to information and in the educational dynamics themselves. Students must understand not only the subject but also the tool or the software used in connection with it (Linne, 2014).

The use of technology in research goes beyond database querying or collaboration. It also involves the use of tools to produce results in a more orderly way that leverages available data. In this regard, Codina (2009) predicted that information managers would be everyday resources that would allow us to work more easily. An example of the use of technology and applications in the University is described by Madison (2015) in explaining how communication programs must continuously adjust to rapid technological changes. Marron (2015) adds the option of offering students the opportunity to research and interact in ways that are different from those commonly used by professors. George-Reyes (2018) notes that the future graduate who uses electronic devices and applications will fit the profile demanded by the labor market.

In the case of Tecnológico de Monterrey, this institution envisages a practice-oriented model similar to those in many Anglo-Saxon and South American countries (Schmal & Ruiz-Tagle, 2009). This educational model strengthens the skills of future professionals, incorporating technology supported by electronic devices that support electronic learning. In addition, communication and information technologies are adapting to the growing diversity of students in university classrooms (Martínez et al., 2016).

Technological resources facilitate simpler negotiation between pedagogical elements and assessment by transferring learning control to the student in a custom-guided way that increases their self-efficacy (Hase & Kenyon, 2000). However, it is clear that the use of mobile devices must be supported by a methodology and a theoretical background that consider the elements of content and structure.

Salaverría (cited by Lugo-Ortiz, 2016) points out that an ever-changing environment like the current one is characterized by the abundance of information, the reduction of decision-making time, and the elimination of geographical barriers, all brought about by various multimedia and interactive forms of production. This is why future journalists and social science researchers must use resources critically and responsibly, something professors must lead (Andueza & Pérez-Arozamena, 2014).

3. Materials

The presence of technology and the need for a tool that would facilitate writing, led to the design of the InContext application. This application allows the student to access different formats for text structuring and to collect information inside or outside the classroom. InContext is specialized software, custom-made by professors Lerma and Flores, that comprises several templates with the basic elements needed in journalistic genres and research reports. Using this software, the student enters information in the template fields, attaches the required multimedia material files, and sends them via email, or uploads them to cloud storage. This information is received (in an inbox) by the professor, who checks that all the fields in the

templates are completed and then assigns a grade. Upon adding information to InContext, students can continue writing the text in their style without fearing the omission of any essential points. Also, the student uploads the material to the cloud so that it can be consulted if needed by the professor or himself. This point is very valuable because it teaches the student that every professional must have an archive where they can retrieve data if necessary, and it promotes learning in terms of organization of materials.

Figure 1. InContext Desktop showing sample templates

The tool explores new ways of sending content and promotes more flexible learning as students can progress at their own pace. The format helps them, for example, by placing an asterisk next to mandatory fields such as the title or sources of information. Students enrolled in the Journalism or Research Methodologies classes at university have access to the tool through a personalized registration process. Professors can also use it after registering. Students select the appropriate template for the preparation of their writing assignment according to the genre. There are 16 templates for journalism and four for research studies. In addition, students can append photos, videos, audios, and link text documents. InContext allows for the generation of PDF reports.

4. Methodology

The research was carried out in several stages. The preliminary phase, November-December 2018, aimed to test the usability of the tool and make adjustments to the design of templates. To achieve usability, we applied one exercise using the app and another without it, and we administered a usage satisfaction questionnaire to the 300 students enrolled in the Journalism classes as well as in the Research Methodology courses at Tecnólogico de Monterrey, Monterrey Campus. Based on the results, we developed a quasi-experimental design and applied the tool during the months of October and November 2019. Our sample was taken from all students (226) enrolled in ten different Journalism and Research Methodologies classes in this university at that time.

The participants were both men and women between 18 and 22 years old, who were between the third and ninth semesters of their programs which included Journalism, Communication, International Relations, Psychology, Advertising, Law, and Economics.

The sample for this study consisted of 30 students in journalism courses and 27 in research methodologies. Random selection was made from the enrollment data of the students, and those who were selected were invited to participate voluntarily. Enrollment was the only element of identification, and students were informed of the research objectives and the ethical parameters. The exercise was

divided into two time periods. In the first (October 2019), the students answered (online) the scaled Motivated Strategies and Learning Questionnaire (MSLQ) (Pintrich et al., 1991). In the second time period (November 2019), professors took time from their courses for two activities; namely, the execution of one journalism or research methods exercise, as the case may be, using the application. Subsequently, the students were requested to respond to the questions on the scale as a post-test.

The MSLQ is an important tool to account for the main methods involved in the teaching-learning process of college students; it also provides relevant information to determine their specific skills that are deficient and therefore require training (Burgos-Castillo & Sánchez-Abarca, 2012). The Learning Strategies questionnaire consists of 81 items divided into two parts: the first concerns Motivation to Learn, and the second refers to Learning Strategies. In the case of this research, we only considered the items of the second part because the assumptions established were directly related to the measurement of the impact of learning strategies, regardless of whether there was mediation by technology or not.

The exercise for the journalism courses consisted of preparing a draft of a report about a real event. The writing assignment description included approximately 500 words, two photographs with caption, title, and a link to a video produced by the student. On the other hand, the research exercise was based on a public health phenomenon in the real world. It called for the formulation of a research problem, providing two specific objectives, justification, title, and three keywords. InContext was used to perform both exercises. The pre-test and post-test were created using Qualtrics, and they were based on the second section (B) of the MSLQ scale; consisting of 50 items focused on Learning Strategy. The students responded by selecting answers on a seven-point Likert scale from 1 "Not true to me" to 7 "Totally true to me". The values in between were considered and decided by the student. The measurement of six cognitive skills on the MSLQ scale was useful to the study objective, which sought to review whether the use of technology in the classroom resulted in the development of cognitive skills among the students. According to Arellano (2012), these six skills can be defined as follows:

- Critical Thinking: Focuses on the degree to which the student uses prior knowledge in new situations to make critical assessments, solve problems, or make decisions.
- Creation of texts: Allows evaluation of the use of working strategies in writing, such as developing a summary, paraphrasing, analogy creation, among others.
- Meta-cognitive self-regulation: These are the items related to the awareness, knowledge, and control that the student has over his own cognition.
- Effort Regulation: Highlights the ability to control the amount of effort and attention given to distractions or tasks that are difficult or of little interest.
- Organization: Refers to the use of information-organization strategies, such as deciding the themes in a text and structuring them into conceptual diagrams or maps, and selecting the main ideas in a text.
- Search Help: Measures the willingness to ask peers or the professor for help in the face of a problem.

The following hypotheses were determined from the objective of this research study:

- H_1: Using the InContext *app* improves students' critical thinking.
- H_2: Using the InContext app improves the ability to create texts.
- H_3: Using the InContext app improves cognitive self-regulation in the creation of texts.
- H_4: Using the InContext app promotes the regulation of effort and concentration.
- H_5: Using the InContext app improves the organization of bibliographic material for text creation.
- H_6: Using the InContext app promotes the search for help.

5. Analysis and results

Based on the hypotheses indicated above, the questions contemplated on the MSLQ scale were analyzed (Pintrich et al., 1991), for each of the six variables around which the hypotheses revolve: Critical thinking, writing, the ability to self-regulate, the regulation of effort, the organization of materials, and search for help.

Table 1. Descriptive statistics of Journalism students using the app			
	N	Mean	Standard Deviation
Pre-test Critical Thinking	30	5.1667	.92637
Pre-test Creation (Writing)	30	5.2300	.88596
Pre-test Self-regulation	30	4.5767	.73141
Pre-test Regulation of Effort	30	4.3567	.43524
Pre-test Organization	30	4.8667	1.02833
Pre-test Search for Help	30	5.1867	.97264
Post-test Critical Thinking	30	5.2867	.87049
Post-test Creation (Writing)	30	5.2500	.87287
Post-test Self-regulation	30	4.8900	.73030
Post-test Regulation of Effort	30	4.6277	.64340
Post-test Organization	30	4.8500	1.25017
Post-test Search for Help	30	5.3083	.80591
Valid N	30		

Tables 1 and 2 show the data collected from the participating sample of students who used the application, i.e., 30 students taking journalism courses and 27 taking the research methodology courses.

The average of each variable in both the pre-test and the post-test was established, and, subsequently, the data were combined so that one could see the average achieved by the students according to the type of variable. This is displayed in Table 1 for the Journalism students and in Table 2 for the students taking Research Methodologies.

Table 2. Descriptive statistics of Research Methodology students using the app			
	N	Mean	Standard Deviation
Pre-test Critical thinking	27	4.8519	1.26806
Pre-test Creation	27	4.9000	1.13781
Pre-test Self-regulation	27	4.5667	.91652
Pre-test Regulation of effort	27	4.2481	.83775
Pre-test Organization	27	4.5630	1.13006
Pre-test Search for Help	27	5.4852	1.05565
Post-test Critical thinking	27	5.2963	1.07613
Post-test Creation	27	5.3370	.87008
Post-test Self-regulation	27	4.8815	.86471
Post-test Regulation of effort	27	4.5370	.78356
Post-test Organization	27	5.0648	1.38431
Post-test Search for help	27	5.4722	1.09046
Valid N	27		

For the hypotheses tests, the subjects of Journalism (n-30) and Research Methodologies (n-27) were separated, and the significance of each of the six variables was analyzed, considering the pre-test and the post-test so that it could be determined whether there was improvement due to the use of the application.

Table 3. Results of using the app for the Journalism subject Wilcoxon Signed Ranks Test						
	Post-test Pre-test Critical Thinking	Post-test Pre-test Creation	Post-test Pre-test Self-regulation	Post-test Pre-test Regulation of Effort	Post-test Pre-test Organization	Post-test Pre-test Search for help
Z	-.714[c]	-.013[c]	-2.474[c]	-1.515[c]	-.752[d]	-.741[c]
Asymp. Sig. (2-tailed)	.475	.989	.013	.130	.452	.459

Table 3 shows that in the case of the Journalism students, it is only possible to accept the third hypothesis, which points to the improvement in cognitive self-regulation in writing texts when using the app.

Table 4 shows the results for the Research Methodology students, and it was detected that the data are statistically significant in accepting the first three hypotheses concerning improvement in critical thinking, creation, and self-regulation when using the app.

Table 4. Results of using the app for the Research Methodologies subject Wilcoxon Signed Ranks Test						
	Post-test Pre-test, Critical Thinking	Post-test Pre-test Creation	Post-test Pre-test Self-regulation	Post-test Pre-test Regulation of effort	Post-test Pre-test Organization	Post-test Pre-test Search for help
Z	-2.354[c]	-2.612[c]	-2.533[c]	-1.576[c]	-1.652[c]	-.470[d]
Asymp. Sig. (2-tailed)	.019	.009	.011	.115	.098	.638

Table 5 shows the hypotheses tests considering the entire sample (n-57). These results indicate that there is statistically significant evidence to accept the first four hypotheses.

Table 5. Results of using the app in both subjects Wilcoxon Signed Ranks Test						
	Post-test Pre-test Critical thinking	Post-test Pre-test Creation	Post-test Pre-test Self-regulation	Post-test Pre-test Regulation of effort	Post-test Pre-test Organization	Post-test Pre-test Search for help
Z	-2.192[c]	-1.811[c]	-3.497[c]	-2.270[c]	-.995[c]	-.245[c]
Asymp. Sig. (2-tailed)	.028	.070	.000	.023	.320	.807

These results show that when the two samples are combined, there is a positive effect on four variables: critical thinking, text-creation strategies, metacognitive self-regulation, and stress regulation. These are relevant to learning and the cognitive skills that a university student develops because the results imply that the student can apply knowledge in new situations and make decisions; he or she can also take control over their acquisition of knowledge and have the ability to focus on tasks. On the other hand, it was not possible to find statistically significant data with respect to organization or the search for help.

It should be noted that the only variable with statistically significant values in the samples tested separately and jointly is metacognitive self-regulation, which may indicate that the application is more useful for improving control, knowledge acquisition, and awareness than the student's own cognition. In this way, we can point out that, for the Journalism students, one can accept the H_3 hypothesis: The use of the InContext app improves cognitive self-regulation in the creation of texts.

For students in the Research Methodologies course sample, the first three hypotheses are accepted:

- H_1: There is a significant difference in the means in the critical thinking of students between the pre-test and the post-test.
- H_2: There is a significant difference in the means in the ability to write texts between the pre-test and the post-test.
- H_3: There is a significant difference in the means in the improvement of cognitive self-regulation in the creation of texts between the pre-test and the post-test.

When the two samples are combined, the first three hypotheses are accepted, as well as the fourth one:

- H_4: There is a significant difference in the means in the regulation of effort between the pre-test and the post-test.

6. Discussion and conclusions

The results are relevant based on the hypotheses raised because they consider the possibility of developing cognitive skills when using InContext. This implies that the application presents a practical utility for the student and professor while promoting cognitive self-regulation. This is as Schena (2018) points out: The skills defined as the most important (for the professional future of communication) are the ability to understand and interpret complex environments, using critical thinking, and having the ability to present the results of research projects properly.

The use of a technological innovation such as the InContext app strengthens the domain of the format and also assists in the collection of the textual and audiovisual data that are generated with other tools and devices. This enables the researcher to concentrate on content and analysis and leave the elements of formatting to the utility of the tool (Lazo et al., 2018).

In the case of journalism students (López-García et al., 2019), training should be directed toward the creation of deep content and the management of technological tools that incorporate mobility, interactivity, and documentation. Solar and Diaz (2019), in their research on teaching strategies, show that many professors use memory-based exercises as their main strategy, which result in the students having poor

reading comprehension. In addition, their study affirms that students "learn by doing," and technological innovations can foster other strategies necessary for the professional environment.

The use of technology as a work tool for learning is essential because, as Roses and Humanes (2014) point out, journalism professors develop a wide variety of activities: They stimulate the critical thinking of students, carry out scientific research, publish, facilitate internships in companies, and share their knowledge.

Additionally, one must consider that students are capable of quickly adopting new technologies, and they have the ability to find other applications on their own to enrich their academic exercises. Therefore, it is important that professors promote a more intensive use of technology in the classes, because, in the end, the world of work demands the combination of old and current practices (García-Santamaría & Barranquero, 2014). These new practices can favor digital newspapers that need to attract and retain readers (Marcos-Recio et al., 2018).

It is important to highlight the relevance of *intending* to use technology to develop learning strategies, defined by Gargallo (2009) as the organized, conscious, and intentional activities of the learner to achieve a particular learning objective. Thus, the student can acquire useful metacognitive skills not only in his academic life but also in professional life (Alvarez et al., 2018).

Several limitations were found in this research, and one of them relates to the attendance of students in their courses. Given that the application of the pre-test took place in October, while the activity with the application and the post-test took place in November, many students who had responded to the questionnaire the first time were not present in their classes in the second part of the work. A high level of absenteeism made it impossible to compare the data of a large number of students. Also, the students could not always concentrate because, in some courses, they had exams or assignments that directed attention to those activities instead of responding to the questionnaire.

A positive aspect was that the participating students felt confident that this study did not involve risks, and the exercise with the app even caused interest in them, so they decided to continue working on the subject.

The use of educational innovations encourages new stimuli and can induce the student to be the architect and protagonist of his own training process. As Ramos et al. (2010) point out, the use of mobile devices for learning can generate a collaborative and innovative environment in which students feel motivated to work and learn even while unaware. This requires deploying educational strategies that use technology to develop cognitive skills such as critical thinking.

The proposal for the creation and use of this application stands out because it is a new form of content delivery that also allows for the incorporation of audiovisual tools. From the templates of the app, one can create a lot of texts because the student looks for the best angle to accommodate the information, thereby developing creativity. Although it is not simple to introduce changes at the curriculum level in universities, it is crucial to become adaptable to technology (Manfredi-Sánchez et al., 2019).

The relevance of this proposal is that the studies carried out so far on the use of technologies in education focus on technological tools such as databases, distance education, peer collaboration, or development of global competencies like writing or using point-in-time technology tools such as cameras and video cameras. However, little has been researched about the use of specific mobile applications that present a guiding structure for writing and data management aspects of research methodologies.

Up to now, public universities in Mexico have focused their attention on the acquisition of fixed equipment and collective use throughout electronic classrooms and computer centers or laboratories, neglecting another important source of technological resources, namely, mobile devices. There is no general institutional policy that promotes the strategic use of such devices or gadgets for educational purposes in Mexico (Batista-Herrera, 2009). It remains for future research to involve a higher number of students in a comparative study with control and experimental groups. In the future, researchers or professors who wish to make use of this application will be able to strengthen learning mechanisms among their students.

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References

AECJMC (Ed.) (2019). Accrediting council on education in journalism and mass communications. http://bit.ly/2TRxGD0

Ajayi, A., Ayo, C.K., & Olamide, O. (2019). Mobile learning and accounting students' readiness in tertiary and professional institutions in Nigeria. *Cogent Arts & Humanities*, 6(1), 1-25. https://doi.org/10.1080/23311983.2019.1676570

Álvarez Flores, E.P., Núñez-Gómez, P., & Olivares-Santamarina, J.P. (2018). Perfiles profesionales y salidas laborales para graduados en Publicidad y Relaciones públicas: de la especialización a la hibridación. *El Profesional de la Información*, 27(1), 136-136. https://doi.org/10.3145/epi.2018.ene.13

Anand, G., Chhajed, D., Hong, S.W., & Scagnoli, N. (2014). Introducing mobile technology in graduate professional education. *E-Learning and Digital Media*, 11, 543-553. https://doi.org/10.2304/elea.2014.11.6.543

Arellano-Moreno, M.A. (2012). *Aprendizaje autorregulado en estudiantes sobresalientes de nivel medio superior bilingüe en México*. [Master Dissertation, Universidad de Nuevo León]. http://bit.ly/2IFvXdB

Asociación de Internet.mx (Ed.) (2018). *14º Estudio de Hábitos de Internet en México*. Asociación de Internet.mx. http://bit.ly/2vT1Qgj

Berger, G., & Foote, J. (2018). Haciendo un balance de la educación periodística contemporánea: El final del aula como la conocemos. In *Educación global de periodismo en el siglo XXI: Retos e innovaciones* (pp. 229-246). Knight Center for Journalism. http://bit.ly/2E2WKhI

Burgos-Castillo, E., & Sánchez-Abarca, P. (2012). *Adaptación y validación preliminar del cuestionario de motivación y estrategias de aprendizaje (MSLQ)*. [Degree Dissertation, Universidad del Bío-Bío]. http://bit.ly/2QaGotM

Carcelén, S., Mera, M., & Irisarri, J. (2019). Mobile phone useby university students in Madrid: A management-based typology during times of learning. *Communication & Society*, 32, 199-211. https://doi.org/10.15581/003.32.1.199-211

Deuze, M. (2018). Sobre los medios y el emprendimiento como formas de ser en el mundo: Un desafío para la investigación periodística. In *Educación Global de Periodismo en el siglo XXI: Retos e innovaciones* (pp. 283-300). Knight Center for Journalism. http://bit.ly/2wOc9SW

Hase, S., & Kenyon, C. (2007). Heutagogy: A child of complexity theory. *Complicity*, 4(1), 111-118. https://doi.org/10.29173/cmplct8766

Herrera-Batista, M. (2009). Disponibilidad, uso y apropiación de las tecnologías por estudiantes universitarios en México: Perspectivas para una incorporación innovadora. *Revista Iberoamericana de Educación*, 48(6), 1-9. https://doi.org/10.35362/rie4862130

Laskin, A.V., & Avena, J. (2015). Introduction of mobile media into formal classroom learning environments. *Journalism & Mass Communication Educator*, 70(3), 276-285. https://doi.org/10.1177/1077695815601170

Linne, J. (2015). Estudiar en Internet 2.0. Prácticas de jóvenes universitarios de la ciudad de Buenos Aires. *Comunicación y Sociedad*, 23, 195-213. https://doi.org/10.32870/cys.v0i23.69

López, M.B.A., & Arozamena, R.P. (2014). El móvil como herramienta para el perfil del nuevo periodista. *Historia y Comunicación Social*, 19(0), 591-602. https://doi.org/10.5209/rev_hics.2014.v19.44987

López-García, X., Silva-Rodríguez, A., Ángel Antonio Vizoso-García, Westlund, O., & Canavilhas, J. (2019). Mobile journalism: Systematic literature review. *Comunicar*, 59, 9-18. https://doi.org/10.3916/c59-2019-01

Lugo-Ortiz, L. (2016). The academia, the media and the ideal profesional: A generalist-multimedia journalist. *Communication & Society*, 29(4), 271-286. https://doi.org/10.15581/003.29.4.271-286

Madison, E. (2015). Mobile media best practices: Lessons from 5 years of or magazine. *Journalism & Mass Communication Educator*, 70(3), 324-330. https://doi.org/10.1177/1077695815600479

Manfredi-Sánchez, J.L., Ufarte-Ruiz, M.J., & Casa, J.M.H.D.L. (2019). Innovación periodística y sociedad digital: Una adaptación de los estudios de periodismo. *Revista Latina de Comunicación Social*, 74, 1633-1654. https://doi.org/10.4185/rlcs-2019-1402

Marcos-Recio, J.C., Edo-Bolós, C., & Parra-Valcarce, D. (2018). Retos pendientes de los periódicos digitales en la información de actualidad: Estudios de casos en medios españoles. *Communication & Society*, 31, 51-70. https://bit.ly/2QBVkRU

Marron, M.B. (2015). New generations require changes beyond the digital. *Journalism & Mass Communication Educator*, 70, 123-124. https://doi.org/10.1177/1077695815588912

Marta-Lazo, C., González-Aldea, P.C., & Herrero-Curiel, E. (2018). Competencias profesionales y perfiles en Periodismo demandados por las empresas: Análisis de las ofertas en LinkedIn e Infojobs. *Comunicación y Sociedad*, 31, 211-228. https://bit.ly/2wvrl7x

Martín-Serrano, M. (2019). La comunicación y la información en un mundo que se virtualiza. Desarrollos y funciones previsibles. *Comunicación y Sociedad*, (pp. 1-29). https://doi.org/10.32870/cys.v2019i0.7478

Mu, H., & Paparas, D. (2015). Incorporating the advantages of clickers and mobile devices to teach Economics to non-economists. *Cogent Economics & Finance*, 3(1), 1-10. https://doi.org/10.1080/23322039.2015.1099802

Pauleen, D., Campbell, J., Harmer, B., & Intezari, A. (2015). Making sense of mobile technology: The integration of work and private life. *SAGE Open*, 5(2), 1-10. https://doi.org/10.1177/2158244015583859

Pérez-Rodríguez, M.T. (2009). Clinical significance of "anti-HBc alone" in human immunodeficiency virus-positive patients. *World Journal of Gastroenterology*, *15*, 1237-1237. https://doi.org/10.3748/wjg.15.1237

Pintrich, P., Smith, A.F., Duncan, T., & Mckeachie, W.J. (1991). A Manual for the use of the motivated strategies for learning questionnaire (MSLQ). http://bit.ly/2QcnSBn

R, M.I.S., & L, C.D. (2009). Los procesos de enseñanza-aprendizaje en el aula universitaria: Una mirada desde las creencias de académicos de trabajo social y periodismo. *Estudios Pedagógicos*, *35*(1), 181-197. https://doi.org/10.4067/s0718-07052009000100011

Ramos-Elizondo, A.I., Herrera-Bernal, J.A., & Ramírez-Montoya, M.S. (2010). Developing cognitive skills with mobile learning: A case study. [Desarrollo de habilidades cognitivas con aprendizaje móvil: un estudio de casos]. *Comunicar*, *34*, 201-209. https://doi.org/10.3916/c34-2010-03-20

Roses, S., & Humanes, M.L. (2014). La innovación educativa, subestimada: Análisis de la importancia que le otorgan los estudiantes de Periodismo. *Historia y Comunicación Social*, *19*(0), 479-490. https://doi.org/10.5209/rev_hics.2014.v19.45148

Santamaría, J.V.G., & Carretero, A.B. (2014). La formación universitaria en periodismo. ¿Mera capacitación tecnológica o una formación integral en el nuevo ecosistema informativo? *Historia y Comunicación Social*, *19*, 641-541. https://doi.org/10.5209/rev_hics.2014.v19.44991

Schena, J., Besalú, R., & Casellas, C.S. (2018). Valoraciones actualizadas de las competencias profesionales en la práctica laboral de los periodistas españoles. *Revista Latina de Comunicación Social*, *53*, 531-555. https://doi.org/10.4185/rlcs-2018-1268

Wakefield, J., Frawley, J.K., Tyler, J., & Dyson, L.E. (2018). The impact of an iPad-supported annotation and sharing technology on university students' learning. *Computers & Education*, *122*, 243-259. https://doi.org/10.1016/j.compedu.2018.03.013

Walck, P.E., Cruikshank, S.A., & Kalyango, Y. (2015). Mobile learning: Rethinking the future of journalism practice and pedagogy. *Journalism & Mass Communication Educator*, *70*(3), 235-250. https://doi.org/10.1177/1077695815600478

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