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Emerging mobile media: Convergence in the new media arena

Medios móviles emergentes: Convergencia comunicativa en el nuevo escenario mediático

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CIRC

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ERIH+

Level INT2 (2018).

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THEMATIC EDITORS

Dr. Xosé López, University of Santiago de Compostela (Spain)
Dr. João Canavilhas, University of Beira Interior (Portugal)
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Contents are peer reviewed, in accordance with publication standards established in the APA (American Psychological Association) manual. Compliance with these requirements facilitates indexation in the main databases of international journals in this field, which increases the dissemination of published papers and therefore raises the profile of the authors and their centres.

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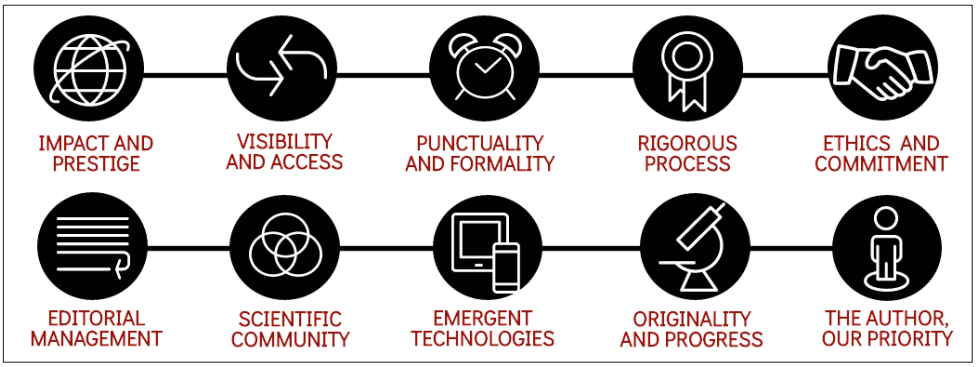

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- Percent of manuscripts accepted: 3,91%; Percent of manuscript rejected: 96,09%.
- Received manuscripts internationalisation: 32 countries.
- Numbers of Reviews: 226 (update: www.comunicarjournal.com).
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- Country of origin: 3 countries (Norway, Portugal, and Spain).
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Mobile journalism: Systematic literature review

Periodismo móvil: Revisión sistemática de la producción científica

Dr. Xosé López-García is a Full Professor of Journalism in the Department of Communication Science at the University of Santiago de Compostela (Spain) (xose.lopez.garcia@usc.es) (https://orcid.org/0000-0002-1873-8260)

Dr. Alba Silva-Rodríguez is Assistant Professor in the Department of Communication Science at the University of Santiago de Compostela (Spain) (alba.silva@usc.es) (https://orcid.org/0000-0002-1221-5178)

Ángel-Antonio Vizoso-García is Researcher in training in the Department of Communication Science at the University of Santiago de Compostela (Spain) (angel.vizoso@usc.es) (https://orcid.org/0000-0001-7898-9267)

Dr. Oscar Westlund is Professor at the Oslo Metropolitan University (Norway) (oscarw@oslomet.no) (https://orcid.org/0000-0002-9029-6065)

Dr. João Canavilhas is Associate Professor at the University of Beira Interior (Portugal) (jc@ubi.pt) (https://orcid.org/0000-0002-2394-5264)

ABSTRACT

The era of mobile media has placed communications convergence at a new stage. The importance of studies about mobile communications has been growing increasingly over the last years. This growth is connected to the increase in the access to contents through new devices. The last ten years have seen a process of acceleration in mobile technology innovations. The peak of this new scenario has been the interest of the research community in investigating the relationship between such innovations and the spread of informative contents. This article analyses those studies that address the relation between mobile devices and communication and journalism. The main objective is to clarify the current state of these studies as well as to define their significance within the current convergence scenario. In order to reach such objectives, a Systematic Literature Review (SLR) was conducted. The authors analysed 199 research articles published between January 2008 and May 2018 in the database Web of Science. The findings suggest that the United States has the largest number of studies in relation to this topic. We can pinpoint the highest increase in scientific production about journalism and mobile communications in 2013. Besides, it exists a dominance of those articles related with actants upon those ones about actors or audiences.

RESUMEN

La era de los medios móviles ha situado la convergencia comunicativa en un nuevo estadio. La movilidad ha abierto un gran campo en la cambiante sociedad red. La producción científica sobre periodismo móvil ha adquirido un mayor protagonismo gracias a las mejoras técnicas de los dispositivos y a la democratización en el acceso a los contenidos por parte de los usuarios. En los últimos diez años se ha producido una aceleración en las innovaciones tecnológicas que se ha traducido en un mayor interés por esta área de estudio. En este trabajo se analizan los artículos sobre dispositivos móviles y periodismo a fin de definir el momento actual del proceso y situar el papel que ocupan en el escenario convergente. El método ha sido una revisión sistemática de la literatura científica (SLR) de 199 artículos publicados entre enero del 2008 y mayo del 2018 en la base de datos Web of Science. La validación siguió los criterios de inclusión y exclusión, identificación de la base de datos, motores de búsqueda, y evaluación y descripción de resultados. Los hallazgos indican que en Estados Unidos se concentra el mayor número de publicaciones relacionadas con este tema y que el auge de la producción científica sobre periodismo móvil se da en el año 2013. Se concluye que existe un predominio de publicaciones relacionadas con los actantes en detrimento de aquellas que versan sobre actores o audiencias.

KEYWORDS | PALABRAS CLAVE

Mobile communication, mobile journalism, digitalization, convergence, mobility, innovation, personalization, ubiquity.
Comunicación móvil, periodismo móvil, digitalización, convergencia, movilidad, innovación, personalización, ubicuidad.

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1. Introduction

Over the last two decades, the media arena has become increasingly digital thanks to the development of advanced and often cheaper devices, with improved connectivity and a wider supply of products and services. There is a long academic tradition on the study of digitisation and innovation processes in newsrooms. From Castells (1996), who explored the so-called network society and its technological reach, to the metamorphosis (Fidler, 1997) and the digitisation process of the news by Boczkowski (2004). Studies on aspects such as multimediality (Deuze, 2005), interactivity (Scolari, 2008), convergence (Salaverría & García-Avilés, 2010), participation (Masip & al., 2015), personalisation (Thurman, 2011), memory and documentation (Guallar, 2011), and the mobility in the use of the new media (Westlund & Lewis, 2014), among others, have been of particular importance. The relevance of information and automation technologies has been obvious ever since Manovich (2013) drew attention to how software had acquired the leading role. The trend has become even more important for a good part of processes, such as the search, development, and dissemination of contents. Innovation processes in newsrooms (Paulussen, 2016) consider content production for mobile devices a priority, namely mobile journalism –MOJO– and participation (Barnes, 2016), which is carried out, in a very large percentage, from mobile devices.

The transformation process of media technologies as regards their adaptation to everyday life, routines and social environments have been studied by many authors over the past few years (Silverstone & al., 1992; Haddon, 2007). Mobiles have been studied, from the beginning, as driving forces of a sociological change that are able to shape our everyday life (Ling, 2004; Ling & Haddon, 2001; Oksman & Rautianen, 2002). The growth in mobile users (GSMA, 2018) reveals that the media industry is facing a challenge. Adapting to a mobile audience that consumes content preferably through mobile devices (Reuters Institute, 2018) is a priority that requires knowing the characteristics and particularities of this new communicative platform.

Mobile communication refers to the access to contents from mobile devices and to the constant connection of individuals. Castells (2006) highlights the permanence and ubiquity as two of the factors that help to understand this phenomenon. During the past decade, mobiles have gradually become portable devices, personal laptops. This quality, which facilitates interpersonal communication, has been highlighted by the majority of researchers in this area (Ling, 2004; Fortunati, 2001; Habuchi, 2005; Matsuda, 2005; Wei & Lo, 2006).

Mobile devices are conceived as essential elements to deal with the new social structure that affects human implications, interventions between organizations and social institutions (Geser, 2004).

The launch of the Apple iPhone in 2007 marks the beginning of a new era in the digitisation process and creates a new standard to understand the meaning of mobile communications and the media in particular (Scolari, Aguado, & Feijoo, 2012).

Although these have always been "mobile" according to Bruhn (2013), they transform the paradigm of traditional media (Westlund, 2011), providing new synchronic, located and individualised formats (Bruhn, 2013), and modifying social contexts and ways of producing, disseminating and receiving contents.

Wei (2013) defines mobile media as personal, interactive, Internet-enabled portable platforms and controlled by users. The value of mobility, together with its personal, private (Lorente, 2002) and individualistic nature (Soletic, 2008) aimed at the personalisation (Martin, 2009) are some of the elements that define the mobile device. Aguado and Martínez (2006) point out that most of the success of the spread of telephony is due to its adherent characteristics: ubiquity, personal character, translocality, and always-on connectivity.

It is necessary to specify that the phenomenon of mobile journalism has not yet been unanimously conceptualised in Academia. At first, the term has been considered a successor of multimedia journalism, but, in reality, it is a new field with its own characteristics. The difference lies in mobility, which opens space for diverse interpretations within this new context. Some authors, in the attempt to provide a more reliable explanation of this new journalistic practice, chose to call it mobile digital journalism (Campbell, 2007), mobile news journalism (Forsberg, 2001), and mobile journalism (Briggs, 2007; Quinn, 2000; Pavlik, 2001; Castells, 2006). The concept should be understood from the media perspective, as noted by Goggin and Hjorth (2009) and Virpi (2010), which leads us to affirm that we are faced with two different perspectives that help to provide a clearer definition of this new field of study. On the one hand, that which refers to the dissemination and reception of content for mobile devices and, on the other hand, that which focuses on content production.

Although, as we have already seen, the scientific production on mobile communication is very common, the study of mobile journalism has serious research gaps. Pearce (2013) found absences of knowledge in existing scientific production, alerting to the need to conduct studies with a higher theoretical commitment and rigorous methods. Works

focused on this area address the technical characteristics of devices (Ahonen, 2008; Jokela & al., 2009) and the challenges of journalistic companies within the contexts of the mobile society, focused on the need to adapt to the public segmentation and to the era of the permanent connectivity (Aguado & Martínez, 2006). Researchers agree that this new context facilitates the creation of innovative strategies as regards distribution and business models (Aguado, 2012) and facilitates the creation of new expressive modalities (Sánchez & Aguado, 2010). Cebrián and Flores-Vivar (2011) affirm that news contents disseminated through mobile devices went through three main phases: adaptation, autonomy, and emancipation. The main published articles in this field focus on the use of mobile devices and its social impact, referring to, for instance, changes in structuring, communication methods and mutation in traditional values such as space and time, public and private, identity, and security and solitude, among others. However, these are descriptive works with a low degree of theoretical research. In this sense, there is a lack of analytical and practical studies about mobile journalism from its three main branches: broadcasting, dissemination, and reception of contents.

Taking into account these absences of knowledge, the article aims to analyse recent studies (2008-18) produced in the articulation of mobile journalism, in order to know what kind of research has been done in this field, the contexts in which these practices have been developed and the challenges detected. The ultimate goal is to provide knowledge about the complexity of the mobile ecosystem as its role in the communication arena becomes more important during the second decade of the third millennium (Aubusson, Schuck, & Burden, 2016).

> Studies on mobile device impact on communication processes in general and news-makingg processes in particular have been widely studied topics over the last years. Thus, referenced works in this research are the continuation of experiences started by theorists such as Castells (1996) and Fidler (1997), precursors in advancing the degree of impact that mobile technologies would have in the evolution of communication in its different forms and supports.

2. Material and method

The general plan to know and understand the role of emergent mobile media in the scenario of media convergence is based on a methodological design that starts from the systematic scientific literature review. It is based on the RSL protocol proposed by Kitchenham (2004), which has had greater impact in the last ten years (between January 2008 and April 2018). The systematic review, which is part of the secondary research and whose basis is the scrupulous respect for transparency and systematization (Codina, 2017), allows us to know the main contributions to the state of the art. This technique will allow us to "identify, assess and interpret the available data within a time period of a specific research field" (Ramírez-Montoya & García-Peñalvo, 2018), that we have set at ten years because this is the point where there is a cycle change in mobile communication.

We worked with inclusion criteria consisting on keywords defined for mobile journalism, the subject of study, and published in English in the period 2008-18. Articles in which the main goal was not related to mobile journalism have been excluded as, for instance, those related to technical aspects of devices and those that affected media literacy processes. The procedure to conduct the review consisted in the selection of studies in the area of Social Sciences through the Web of Science database. This choice is justified because the main objective is to assess articles published in journals with the highest impact at the international level. In order to locate the results, the following categories, collected in Table 1 (next page), were taken into account:

The method followed the steps listed below:

1) Identification of the research field and the period to assess: mobile journalism (2008-18).
2) Selection of sources: research articles from the area of Social Sciences Citation Index (SSCI).
3) Search in the WoS –Web of Science– with the list of final descriptors.

4) Management and filtering of results.

5) Identification of variables to study: descriptive data (year of publication, name of the journal, title of the article, keywords and number of authors); type of study (quantitative, qualitative, descriptive-explanatory, transversal and non-specified); techniques (observation, survey, interviews, content analysis, case study, experimental and non-specified); main contribution; DOI; and finally, institution of origin.

Table 1. Selected descriptors for the search in the Web of Science

Descriptor	Nº of articles
TS=mobile journalism	5
TS=mojo	5
TS=mobile news	18
TS=journalism AND mobile	53
TS=locative AND mobile	40
TS=mobile and social media	6
TS=mobile media	132
Total	259
Matches	60
Total without matches	199

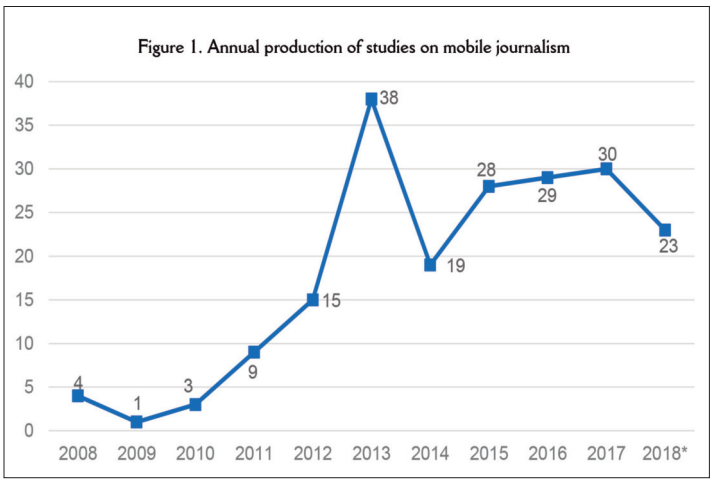
3. Results

This part analyses the most relevant findings during the systematic literature review based on the recent research production on mobile journalism using the above-mentioned descriptors. In total, 199 different papers were reviewed, as a result of the search of seven terms, series of terms and the exclusion of possible matches. Throughout this section, we analyse the main research trends in the subject, taking into account various points of view: publication –number of published articles and titles–, number of signatures and main subject of the papers reviewed. Likewise, the thematic classification formula devised by Lewis and Westlund (2015) was used to divide articles on mobile journalism from the viewpoint of actors, actants, audiences, and activities.

We initially focused on the time distribution of works obtained. As showed in Figure 1, over the last decade there has been a gradual increase in the production of content related to mobile communication, reaching a peak in 2013 with a production of 38 texts related to the selected descriptors. In the following years, the number was reduced, reaching 30 contributions in 2017. For the period covered by this study, 2018, we have identified 23 texts on mobile journalism.

We have found 31 different journals with a scope that includes scientific articles related to the application of mobile technologies with journalism. Table 2 shows journals that have published a hundred or more articles related to the subject studied in the last decade. This information is useful to appreciate how some journals show a higher degree of specialization in this topic. This would be the case of «Mobile Media & Communication» with 55 texts, and «New Media & Society», with 21. It can be seen that only two more titles, «Convergence» and «Journalism Studies» with 12 and 11 articles respectively, surpass the ten texts related to the selected descriptor. Therefore, four publications make up almost 50% of production connected to the terms researched.

We now analyse the characteristics of authorship in the scientific production on mobile journalism indexed in Web of Science over the last decade. Thus, we note that the trend is having a single author in 51.25% of cases –102 of the 199 texts reviewed–. In terms of co-authorship, there are 54 articles signed by two people, and 28 by three people. The maximum number of authors is 9, which happens in two cases.



In terms of the origin of researchers who sign the 199 articles analysed, it is observed that they come from universities based in 30 different countries. Among them, The United States is the country with the greatest presence throughout the revised corpus. Australia hosts the second largest volume of researchers on mobile journalism, while the UK ranks third.

Also, it is possible to identify that 26.13 per cent of reviewed articles are signed by authors from more than one university, while 11.55 per

cent are international researches, that is, signed by authors from more than a country. When it comes to the thematic revision of reviewed titles, we utilized the proposal used by Lewis and Westlund (2015). These authors devised a classification for articles framed within a same reality but approached from different points of view: actors –in this case media professionals–, actants –referring to all related to the construction of messages through mobile devices and their own language–; audiences –receivers of messages produced and communicated through mobile devices–; and activities –routines and tasks carried out by media professionals and users of new devices–. The presence of each thematic line will therefore be observed in the reviewed literature corpus.

Table 2. Assessed publications with 5 or more articles on communication and mobile journalism

Journal	Nº of articles
Mobile Media & Communication	55
New Media & Society	21
Convergence	12
Journalism Studies	11
International Journal of Communication	9
Media International Australia	9
Continuum	8
Journalism	8
Journalism Practice	7
Information, Communication & Society	6
Media Culture & Society	6
African Journalism Studies	5
Comunicar	5
International Journal of Mobile Communications	5

3.1. Actors

This section is framed within studies on news content production taking into account the re-evaluation of traditional journalistic theories in the new digital context (Löffelholz, 2008). Domingo (2008) refers to the production of news as a generic process that includes five stages: 1) access and observation; 2) selection and filtering; 3) processing and edition; 4) distribution; 5) interpretation. This definition serves as a good starting point to analyse the concept of actors regarding the production of news in general.

Papers related to actors are the less numerous, with 17 references. These address the issue of mobile journalism from an approach focused on the use of new technologies by journalists (Deprez & Van-Leuven, 2018; Mills, Pellanda, & Pase, 2017), as well as the comparison between mobile journalists or MoJo and traditional journalists (Blankenship, 2016). There are also, in relation to articles written from the point of view of actors, papers that focus on the use of mobile technologies by citizens that play the role of citizen journalists (Ataman & Çoban, 2018), as well as the implementation of activist journalists' initiatives by communication professionals (Hermida & Hernández-Santaolalla, 2018).

3.2. Actants

For the study of actants (Lewis & Westlund, 2015), we focused on the conception of the smartphone as a meta-media (Jensen, 2016; Márquez, 2017), born in the context of cyberculture (Levy, 2007), that is, a device containing old and new media that offers a broad range of possibilities (Madianou & Miller, 2012). According to this idea, mobile news apps are a good example of technological actants.

We started from a holistic conception of the smartphone (Humphreys, Karnowski, & Von-Pape, 2018), understood as a device that reflects "the instrumental hyper-multifunctionality and the complexity of the new techno-social scenario" (Fumero, 2010).

We found studies related to the usability of devices, a concept popularized by Gibson (1979), and to the intrinsic characteristics of smartphones. In this regard, the ubiquity and persuasiveness stood out (Aguado & Martínez, 2008), as well as the ease to compress video, images and text, and the simplicity in recording, editing and distribution processes through the Internet, opening in turn new means of citizen expression.

Undoubtedly, everything related to languages and the construction of the message through mobile devices is the most addressed thematic approach in mobile journalism research over the last years. Thus, it was observed that 58% of reviewed articles focus on the technical and linguistic characteristics offered by this new technology.

We also found different research lines linked to, among others, aspects such as the change posed by the inclusion of location and GPS services in the news (Goggin, Martin, & Dwyer, 2015); the use of tools for publishing and receiving news through mobile devices (Mills, Egglestone, Rashid, & Väätäjä, 2012); communication structures and dissemination of news through mobile devices (Van-Cauwenberge, d'Haenens, & Beentjes, 2015); and the required adaptation process for the media to efficiently disseminate their contents (Westlund & Färdigh, 2015).

There are also more analytical approaches, focused on the description and analysis of messages produced around a specific event (Mudhai, 2011), and even more technical, based on the analysis of the functionalities of specific mobile applications (Verhoeff, 2017).

3.3. Audiences

When it comes to audiences, 42 references were found, this being the second most used thematic approach. Different study approaches were identified, among them: research focused on users' behaviour when using a specific service or application (Saker & Evans, 2016); the connection between the media and their audiences through the use of new devices as well as new ways of consuming information enabled by these devices (Peters, 2012); the participation and mobilization of users (Mudliar & Donner, 2015); and the response of audiences in new communication environments (Kim, Lee, Hwang, & Jeong, 2016).

Taking as reference the focus of audiences, the reviewed studies provide conclusions centred fundamentally on aspects such as the potential of engagement in contents disseminated through mobile devices against more traditional media (Antunovic, Parsons, & Cooke, 2018), and the relevance of factors such as the role of parents and school training at the time of incorporating news consumption in youth (Edgerly, Thorson, Thorson, Vraga, & Bode, 2018). From the perspective of the connection between citizens and the media, mobile devices are pointed out as tools called to produce changes in news production routines by incorporating materials and testimonials provided by the audience (Lorenzo-Dus & Bryan, 2011). These contributions, so frequent nowadays through spaces such as social networks and other exchange channels, serve to bring individuals and the media closer together in an increasingly collaborative news production process (Soep, 2012).

3.4. Activities

In terms of activities, we grouped together everything related to production and consumption routines by the media and users. 24 of the 199 analysed texts used this thematic approach, looking at the activities carried out during communication processes.

Examples of this are those papers focused on experimentation activities and implementation of new communication processes applied to mobile devices by the media and companies of another industry (Carah, 2017); strategies and actions carried out to protect users' privacy (Vickery, 2015) and the use of certain tools and services of mobile devices in the daily activities of citizens (Frith, 2017).

4. Discussion and conclusions

As reflected in the present text, studies on mobile device impact on communication processes in general and news-makingg processes in particular have been widely studied topics over the last years. Thus, referenced works in this research are the continuation of experiences started by theorists such as Castells (1996) and Fidler (1997), precursors in advancing the degree of impact that mobile technologies would have in the evolution of communication in its different forms and supports.

From the study of the research production on mobile journalism, obtained through the search of different descriptors in the Web of Science database, it was found that, over the last ten years, there has been a gradual increase of papers related to the topic. The data confirm an evolution: in 2008, we foundfour4 references and, in the middle of 2018, the numberamounted too 23.

Throughout the ten years studied, 31 journals included papers focused on communication and mobile journalism in line with the outlined search criteria. However, the trend within this topic is the concentration of research production in four journals that bring together almost half of the research. There is, therefore, a certain specialization or trend of authors to disseminate their findings through Mobile Media & Communication, New Media & Society, Convergence and Journalism Studies, all of them closely linked to the study of the impact of technology in communication processes.

Regarding the characteristics of authorship, the presence of a single author prevails, something that happens in more than half of the papers reviewed. Also, the presence of two signatures in co-authored papers is notable. Regarding the geographical origin of authors, we found 30 different countries. However, researchers based in the United States, Australia and the United Kingdom stand out. We see, then, how the English-speaking countries are the heart of the academic production on the subject.

Finally, following the existing trends regarding the topical distribution of articles, we followed the one proposed

by Lewis and Westlund (2015), dividing texts that address the topic of mobile journalism from four perspectives: actors, actants, audiences and activities. The classification is interesting, as it establishes four ways to approach the phenomenon of mobile journalism. New paths are opened within the relationships between user-media, journalist-user and journalist-media through the technological mediation enabled by mobile devices, both in the production and communication processes and the news consumption. However, in recent years, the greatest weight of mobile communication research has focused on technology, studying both its particularities and the influence of innovation in news production.

Regarding the limitations of the study, these are the determination of the period of study (2008-2018) and the choice of descriptors. The period proposed corresponds to the expansion phase of smartphones as platforms of news content thanks to the release of the iPhone in 2007. Regarding the descriptors used for the Web of Science search, they were selected from a first approach to the literature corpus published in recent years and the words and keywords established by the authors of those papers. Similarly, the choice of the English language for search descriptors in Web of Science acts as a constraint and barrier to all those papers written in other languages such as Spanish and Portuguese, among others.

New paths are opened within the relationships between user-media, journalist-user and journalist-media through the technological mediation enabled by mobile devices, both in the production and communication processes and the news consumption. However, in recent years, the greatest weight of mobile communication research has focused on technology, studying both its particularities and the influence of innovation in news production.

Finally, with regard to future research in this area, there is scope for developing similar studies aimed at knowing the particularities and research trends on the introduction of mobile devices in the everyday life of citizens and in the news production processes. Similar revisions could provide a greater knowledge of thematic trends and used approaches and could serve to give value to research centres and scholars that carry the banner for mobile journalism.

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References

Aguado, J.M., & Martínez, I. (2006). El proceso de mediatización de la telefonía móvil: de la interacción al consumo cultural. *Zer, 20*, 319-343. https://bit.ly/2NWShE2

Aguado, J.M., & Martínez, I. (2008). La cuarta pantalla: industrias culturales y contenido móvil. In J.M. Aguado, & I.J. Martínez, (Coords.), *Sociedad móvil: Tecnología, identidad y cultura* (pp. 187-220). Madrid: Biblioteca Nueva.

Aguado, J.M. (2012). Los gigantes, los ratones y el pastel: Las industrias culturales y el entorno de la movilidad. In H. Navarro & al., Mobile *Communication 2012. Experiències i recerques sobre comunicació mòbil* (pp. 7-21). Vic: Universitat de Vic. Grup de Recerca.

Ahonen, T. (2008). *Mobile as 7th of the Mass Media: Cellphone, cameraphone, iPhone, smartphone.* London: Futuretext.

Antunovic, D., Parsons, P., & Cooke, T.R. (2018). 'Checking' and googling: Stages of news consumption among young adults. *Journalism, 19*(5), 632-648. https://doi.org/10.1177/1464884916663625

Ataman, B., & Çoban, B. (2018). Counter-surveillance and alternative new media in Turkey. *Information, Communication & Society, 21*(7), 1014-1029. https://doi.org/10.1080/1369118X.2018.1451908

Aubusson, P., Schuck, S., & Burden, K. (2016). Mobile learning for teacher professional learning: Benefits, obstacles and issues. *Research in Learning Technology, 17*(3), 233-247. https://doi.org/10.1080/09687760903247641

Barnes, R. (2016). The ecology of participation. In T. Witschge, C.W. Anderson, D. Domingo, & A. Hermida (Eds.), *The Sage Handbook of Digital Journalism* (pp. 192-206). London: Sage. https://doi.org/10.4135/9781473957909.n12

Blankenship, J.C. (2016). Losing their 'mojo'? *Journalism Practice, 10*(8), 1055-1071. https://doi.org/10.1080/17512786.2015.1063080

Boczkowski, P. (2004). *Digitizing the news: Innovation in online newspapers*. Cambridge, MA: MIT Press. https://doi.org/10.7551/mitpress/2435.001.0001
Briggs, M. (2007). *Periodismo 2.0. Una guía de alfabetización digital para sobrevivir y prosperar en la era de la información*. Austin: Knight Center for Journalism in the Americas.
Bruhn, K. (2013). What´s mobile in mobile communication? *Mobile Media & Communication*, *1*(1), 26-31. https://doi.org/10.1177/2050157912459493
Campbell, S. (2007). A cross-cultural comparison of perceptions and uses of mobile telephony. *New Media & Society, 9*(2), 342-363. https://doi.org/10.1177/1461444807075016
Carah, N. (2017). Algorithmic brands: A decade of brand experiments with mobile and social media. *New Media & Society*, *19*(3), 384-400. https://doi.org/10.1177/1461444815605463
Castells, M. (1996). *The information age: Economy, society and culture. The rise of the network society*. Oxford: Blackwell. https://doi.org/10.1108/itp.2002.15.1.74.3
Castells, M. (2006). *La era de la información, economía, sociedad y cultura: La sociedad Red*. Madrid: Alianza.
Cebrián, M., & Flores, J.M. (2011). *Periodismo en la telefonía móvil*. Madrid: Fragua.
Codina, L. (2017). *Revisiones sistematizadas y cómo llevarlas a cabo con garantías: Systematic reviews y SALSA Framework*. https://bit.ly/2Dd0VKf
Deprez, A., & Van-Leuven, S. (2018). About pseudo quarrels and trustworthiness. *Journalism Studies*, *19*(9), 1257-1274. https://doi.org/10.1080/1461670X.2016.1266910
Deuze, M. (2005). What is journalism? Professional identity and ideology of journalists. *Journalism*, *6*(4), 442-464. https://doi.org/10.1177/1464884905056815
Domingo, D. (2008). Inventing online journalism: A constructivist approach to the development of online news. In C. Paterson & D. Domingo (Eds.), *Making online news. The ethnography of new media production* (pp. 15-28). New York: Peter Lang. https://doi.org/10.7146/mediekultur.v24i45.1340
Edgerly, S., Thorson, K., Thorson, E., Vraga, E.K., & Bode, L. (2018). Do parents still model news consumption? Socializing news use among adolescents in a multi-device world. *New Media & Society*, *20*(4), 1263-1281. https://doi.org/10.1177/1461444816688451
Fidler, R. (1997). *Mediamorphosis: Understanding new media*. London: Sage.
Forsberg, K. (2001). *Mobile newsmaking (Tesis de pregrado)*. Göteborg University.
Fortunati, L. (2001). The Mobile Phone: An identity on the move. *Personal and Ubiquitous Computing*, *5*(2), 85-98. https://doi.org/10.1007/PL00000017
Frith, J. (2017). Invisibility through the interface: The social consequences of spatial search. *Media, Culture & Society*, *39*(4), 536-551. https://doi.org/10.1177/0163443717698871
Fumero, A.M. (2010). Introducción: La red en el móvil. *Telos*, *83*, 43-49. https://bit.ly/2xpW0QO
Geser, H. (2004). *Towards a sociological theory of the mobile phone. Sociological Institute*. Zurich: University of Zurich.
Gibson, J.J. (1979). *The ecological approach to visual perception*. Boston: Houghton Mifflin. https://doi.org/10.2307/j.ctt1xp3nmm.20
Goggin, G., Martin, F., & Dwyer, T. (2015). Locative News. *Journalism Studies*, *16*(1), 41-59. https://doi.org/10.1080/1461670X.2014.890329
Goggin, G., & Hjorth, L. (2009). The question of mobile media. In G. Goggin, & L. Hjorth (Eds.), *Mobile technologies: from telecommunications to media*. New York: Routledge. https://doi.org/10.4324/9780203884317
GSMA (Ed.) (2018). *The Mobile Economy 2018*. https://bit.ly/2K6AFo6
Guallar, J. (2011). Content curation en periodismo (y en documentación periodística). *Hypertext*, *11*, 1-5. https://bit.ly/2OzP1LK
Habuchi, I. (2005). Accelerating reflexivity. In I. Mizuko, O. Daisuke, & M. Misa (Eds.), *Personal, portable, pedestrian: Mobile phones in Japanese life* (pp. 165-182). Cambridge, MA: The MIT Press.
Haddon, L. (2007). Roger Silverstone´s legacies: domestication. *New Media & Society, 9*(1), 25-32. https://doi.org/10.1177/1461444807075201
Hermida, A., & Hernández-Santaolalla, V. (2018). Twitter and video activism as tools for counter-surveillance: the case of social protests in Spain. *Information, Communication & Society, 21*(3), 416-433. https://doi.org/10.1080/1369118X.2017.1284880
Humphreys, L., Karnowski, V., & Von-Pape, T. (2018). Smartphones as metamedia: A framework for identifying the niches structuring smartphone use. *International Journal of Communication*, *12*, 2793-2804. https://bit.ly/2NVVgwr
Jensen, K.B. (2016). *Metamedium. The International Encyclopedia of Communication Theory and Philosophy.* https://doi.org/10.1002/9781118766804.wbiect166
Jokela, T., Väätäjä, H., & Koponen, T. (2009). Mobile journalist toolkit: A field study on producing news articles with a mobile device. In A. Lugmayr, H. Franssila, O. Sotamaa, & P. Näränen (Eds.), *Proceedings of the 13th International MindTrek Conference: Everyday Life in the Ubiquitous Era*. Tampere, Finland. https://doi.org/10.1145/1621841.1621851
Kim, S., Lee, J., Hwang, Y., & Jeong, S.H. (2016). Effects of prominent in-game advertising in mobile media: cognitive, affective, and behavioural outcomes and the moderating role of persuasion knowledge. *International Journal of Mobile Communications*, *14*(3), 203-225. https://doi.org/10.1504/IJMC.2016.076271
Kitchenham, B. (2004). *Procedures for performing systematic reviews, TR/SE-0401*. Keele University.
Lévy, P. (2007). *Cibercultura. La cultura de la sociedad digital*. Barcelona: Anthropos.
Lewis, S.C., & Westlund, O. (2015). Actors, actants, Audiences, and activities in cross-media news work. *Digital Journalism*, *3*(1), 19-37. https://doi.org/10.1080/21670811.2014.927986
Ling, R. (2004). *The mobile connection: The cell phone´s impact on society.* San Francisco: Morgan Kaufmann Publishers. https://doi.org/10.5860/choice.42-1907

Ling, R., & Haddon, L. (2001). *Mobile telephony and the coordination of mobility in everyday life. R&D Report. Telenor*. Oslo: Telenor FOU. https://doi.org/10.4324/9780203786826-18
Löffelholz, M. (2008). Heteregeneous – Multidimensional – Competing. Theoretical approaches to journalism: An overview. In D. Weaver, A. Schwartz, & M. Löffelholz (Eds.), *Global journalism research: Theories, methods, findings, future* (pp. 15-27). Malden, MA: Blackwell. https://doi.org/10.1111/j.1460-2466.2010.01492.x
Lorente, S. (2002). Juventud y teléfonos móviles: Algo más que una moda. *Estudios de Juventud*, *57*, 9-24.
Lorenzo-Dus, N., & Bryan, A. (2011). Recontextualizing participatory journalists' mobile media in British television news: A case study of the live coverage and commemorations of the 2005 London bombings. *Discourse & Communication*, *5*(1), 23-40. https://doi.org/10.1177/1750481310390164
Madianou, M., & Miller, D. (2013). Polymedia: Towards a new theory of digital media in interpersonal communication. *International Journal of Cultural Studies*, *16*(2), 169-187. https://doi.org/10.1177/1367877912452486
Manovich, L. (2013). *Software takes command*. London: Bloomsbury Publishing. https://doi.org/10.5040/9781472544988
Márquez, I. (2017). El smartphone como metamedio. *Observatorio*, *11*(2), 61-71. https://bit.ly/2xqCFis
Martín, V. (2009). Identidades juveniles móviles: la sociedad de la comunicación personal. *Educación, Lenguaje y Sociedad*, *6*, 53-68.
Masip, P., Guallar, J., Peralta, M. Ruiz, C., & Suau, J. (2015). Audiencias activas y periodismo. ¿Ciudadanos implicados o consumidores motivados? *Brazilian Journalism Research*, *1*(1), 240-261. https://doi.org/10.25200/bjr.v11n1.2015.815
Matsuda, M. (2005). Discourses of Keitai in Japan. In M. Ito, D. Okabe, & M. Matsuda (Eds.), *Personal, portable, pedestrian: Mobile phones in Japanese life* (pp.19-40). Cambridge, MA: The MIT Press.
Mills, J., Egglestone, P., Rashid, O., & Väätäjä, H. (2012). MoJo in action: The use of mobiles in conflict, community, and cross-platform journalism. *Continuum*, *26*(5), 669-683. https://doi.org/10.1080/10304312.2012.706457
Mills, J., Pellanda, E., & Pase, A. (2017). New Interactions. *Journalism Practice*, *11*(8), 980-999. https://doi.org/10.1080/17512786.2016.1224679
Mudhai, O.F. (2011). Immediacy and openness in a digital Africa: Networked-convergent journalisms in Kenya. *Journalism*, *12*(6), 674-691. https://doi.org/10.1177/1464884911405470
Mudliar, P., & Donner, J. (2015). Experiencing interactive voice response (IVR) as a participatory medium: The case of CGNet Swara in India. *Mobile Media & Communication*, *3*(3), 366-382. https://doi.org/10.1177/2050157915571591
Oksman, V., & Rautiainen, P. (2002). Toda la vida en la palma de mi mano. La comunicación móvil en la vida diaria de niños adolescentes de Finlandia. *Revista de Estudios de la Juventud*, *57*, 25-32. https://bit.ly/2png16k
Paulussen, S. (2016). Innovation in newsrooms. In T. Witschge, C.W. Anderson, D. Domingo, & A. Hermida (Eds.), *The SAGE Handbook of Digital Journalism* (pp. 192-206). London: Sage. https://doi.org/10.4135/9781473957909.n13
Pavlik, J. (2001). *Journalism and new media*. New York: Columbia University Press. https://doi.org/10.7312/pavl11482
Pearce, K. (2013). Phoning it in: Theory in mobile media and communication in developing countries. *Mobile Media & Communications*, *1*(1), 76-82. https://doi.org/10.1177/2050157912459182
Peters, C. (2012). Journalism to go. *Journalism Studies*, *13*(5-6), 695-705. https://doi.org/10.1080/1461670X.2012.662405
Quinn, C. (2000). *mLearning: Mobile, wireless, in your-pocket learning*. Line Zine, Fall. https://bit.ly/2DcUveg
Ramírez-Montoya, M.S., & García-Peñalvo, F.J. (2018). Co-creación e innovación abierta: Revisión sistemática de literatura. [Co-creation and open innovation: Systematic literature review]. *Comunicar*, *26*(54), 9-18. https://doi.org/10.3916/C54-2018-01
Reuters Institute (Ed.) (2018). *Digital News Report 2018*. https://bit.ly/2JDOTwv
Saker, M., & Evans, L. (2016). Everyday life and locative play: An exploration of Foursquare and playful engagements with space and place. *Media, Culture & Society*, *38*(8), 1169-1183. https://doi.org/10.1177/0163443716643149
Salaverría, R., & García-Avilés, J.A. (2010). Concepto de convergencia periodística. In X. López-García, & X. Pereira-Fariña (Ed.), *Convergencia digital. Reconfiguración de los medios de comunicación en España* (pp. 41-63). Santiago de Compostela: Universidad de Santiago de Compostela.
Sánchez-Valverde, E., & Aguado, J.M. (2010). Dispositivos móviles y convergencia digital en los grupos de comunicación españoles: La perspectiva de los profesionales. In J.A. García-Domínguez, & M. De-Moragas (Eds.), *II Congreso Internacional AE-IC Comunicación y Desarrollo en la Era Digital*. Málaga. https://bit.ly/2NtROd5
Scolari, C. (2008). *Hipermediaciones. Elementos para una teoría de la comunicación digital interactiva*. Barcelona: Gedisa.
Scolari, C.A., Aguado, J.M., & Feijoo, C. (2012). Mobile media: Towards a definition and taxonomy of contents and applications. *International Journal of Mobile Technologies*, *6*(2), 29-38. https://doi.org/10.3991/ijim.v6i2.1880
Silverstone, R., Hirsch, E. & Morley, D. (1992). Information and communication technologies and the moral economy of the household. In R. Silverstone, & E. Hirsch (Eds.), *Consuming technologies: Media and information in domestic spaces* (pp.115-31). London: Routledge. https://doi.org/10.4324/9780203401491_chapter_1
Soep, E. (2012). The digital afterlife of youth-made media: Implications for media literacy education. [Generación y recreación de contenidos digitales por los jóvenes: Implicaciones para la alfabetización mediática]. *Comunicar*, *19*(38), 93-100. https://doi.org/10.3916/C38-2012-02-10
Soletic, A. (2008). *Telefonía móvil: Nuevos territorios virtuales en la sociedad de redes. CAC Doc Central Telefonía Móvil*. Santa Fe (Argentina): Universidad Nacional del Litoral. https://bit.ly/2Gf8tO4
Thurman, N. (2011). Making the daily me: Technology, economics and habit in the mainstream assimilation of personalized news. *Journalism*, *12*(4), 395-415. https://doi.org/10.1177/1464884910388228
Van-Cauwenberge, A., d'Haenens, L., & Beentjes, H. (2015). How to take advantage of tablet computers: Effects of news structure on recall and comprehension. *Communications*, *40*(4), 425-446. https://doi.org/10.1515/commun-2015-0020
Verhoeff, N. (2017). Urban interfaces: The cartographies of screen-based installations. *Television & New Media*, *18*(4), 305-319. https://doi.org/10.1177/1527476416667818

Vickery, J.R. (2015). 'I don't have anything to hide, but…': The challenges and negotiations of social and mobile media privacy for non-dominant youth. Information. *Communication & Society, 18*(3), 281-294. https://doi.org/10.1080/1369118x.2014.989251
Virpi, O. (2010). *The mobile phone: A medium in itself. VTT*: Tampere.
Wei, R. (2013). Mobile media: Coming of age with a big splash. *Mobile Media & Communication*, *1*(1), 50-56. https://doi.org/10.1177/2050157912459494
Wei, R., & Lo, V. (2006). Staying connected while on the move. *New Media & Society*, *8*(1), 53-72. https://doi.org/10.1177/1461444806059870
Westlund, O. (2011). *Cross-media news work: Sensemaking of the mobile media (R)evolution*. Gothenburg: University of Gothenburg.
Westlund, O. & Lewis, S.C. (2014). Agents of media innovations: actors, actants and audiences. *The Journal of Media Innovations*, *1*(2), 10-35. https://doi.org/10.5617/jmi.v1i2.856
Westlund, O., & Färdigh, M.A. (2015). Accessing the news in an age of mobile media: Tracing displacing and complementary effects of mobile news on newspapers and online news. *Mobile Media & Communication*, *3*(1), 53-74. https://doi.org/10.1177/2050157914549039

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Young adults' interaction with online news and advertising

La interacción de los jóvenes adultos con las noticias y la publicidad online

Dr. María-del-Pilar Martínez-Costa is Professor in the Media Projects Department at the University of Navarra (Spain). (marcosta@unav.es) (https://orcid.org/0000-0002-6564-0207)

Dr. Javier Serrano-Puche is Associate Professor in the School of Communication at the University of Navarra (Spain). (jserrano@unav.es) (https://orcid.org/0000-0001-6633-5303)

Dr. Idoia Portilla is Associate Professor in the Department of Marketing and Media Management at the University of Navarra (Spain). (Iportilla@unav.es) (https://orcid.org/0000-0002-2504-868X)

Dr. Cristina Sánchez-Blanco is Associate Professor in the Department of Marketing and Media Management at the University of Navarra (Spain). (csblanco@unav.es) (https://orcid.org/0000-0001-6263-6520)

ABSTRACT

This research aims to portray the way young adult people interact with news and how their consumption is affected by advertising and personal data sharing. "Digital News Report Spain 2018", a questionnaire on the consumption of digital media undertaken by a national panel of 2,023 Internet users, is used as a main source. Among the users mentioned, there were 293 young people from 25 to 34 years old who belong to the Millennial generation. Data from this report was completed with a qualitative study in which two focus groups were held, featuring people of that age frame residing in Navarre. The paper concludes that young adult people are generally interested in news, which they access mainly via mobile devices. Their interest grows when the content affects them directly, but also if they empathize with the topic. On the other hand, their familiar background and social routines shape the way they receive information. Young adult people still make use of traditional media, although they consider it ideologically biased. Advertising is something annoying, although they generally have little knowledge and even less intention to use ad-blockers. Finally, their review of the personalized services is negative, but they tend to give away personal data to media if this facilitates their news access.

RESUMEN

Esta investigación tiene como objetivo caracterizar cómo interactúan los jóvenes adultos con las noticias, en qué medida su consumo se ve condicionado por la presencia de publicidad y si se preocupan por la cesión de datos personales. Para ello, se toma como punto de partida el «Digital News Report Spain 2018», informe elaborado a partir de un cuestionario sobre consumo de medios digitales a un panel nacional de 2.023 internautas; de ellos, 293 son jóvenes de 25-34 años, que pertenecen a la generación «millennials». Estos datos se completaron con un estudio cualitativo, realizando dos grupos de discusión con personas de esa franja de edad residentes en la Comunidad Foral de Navarra. Entre las conclusiones de la investigación se señala que los jóvenes adultos se interesan por las noticias, a las que acceden de manera prioritaria por dispositivos móviles. Este interés es mayor cuando el contenido les afecta directamente o si empatizan con la temática de la noticia. Por otra parte, el entorno familiar y las rutinas sociales condicionan su manera de informarse. Siguen accediendo a medios tradicionales, aunque los consideran ideologizados. La publicidad la perciben como molesta, si bien no hay conocimiento ni un uso generalizado de bloqueadores. Finalmente, valoran negativamente los servicios de personalización actuales, aunque ceden algunos datos personales a los medios si le facilita el acceso a la información.

KEYWORDS | PALABRAS CLAVE

Audiences, news consumption, focus groups, young adult people, mobile media, qualitative methodology, privacy, online advertising. Audiencias, consumo de noticias, grupos de discusión, jóvenes adultos, medios móviles, metodología cualitativa, privacidad, publicidad online.

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1. Introduction and current scenario

In today's media ecosystem, in which traditional and digital media coexist and complement one another, it is important to understand the changes that are taking place in people's usage habits and preferences with regard to information. This is particularly important for those groups that have grown up in "a context that is saturated with relational technologies and digital communication" (Buckingham & Martínez, 2013).

The primary objective of this study is to describe how young people in the 25-34 age group interact with news when using mobile media, the extent to which their consumption is conditioned by the presence of advertising, and whether they are concerned about privacy. These young people are members of the so-called millennial generation because they have reached adulthood in the early years of the 21st century (Dimock, 2018). Their commercial potential is of great interest to media outlets and advertisers.

Our initial framework is provided by the bibliography on the subject, complemented by data from the 2018 Digital News Report Spain. This report was coordinated by the Reuters Institute for the Study of Journalism at the University of Oxford. This online questionnaire offers insights into the consumption of digital news in Spain by Internet users who accessed the news in the previous month (Reuters, 2018).

However, this initial literature review needs to be complemented with the addition of a qualitative study to explain the motives underlying the behaviour observed. To do this, we set up two group discussions involving young adults from Navarre. Their media usage is described beforehand and is based on the Media Audience Study produced by the Centre for Research and Opinion Polling (CIES, 2018).

By reviewing the literature and quantitative secondary sources, and conducting our own qualitative study, we will be able to gain a better understanding of the perception and behaviour of the people in this age group with regard to news, advertising and privacy.

1.1. Communication, mobile media and information consumption

Today, the increasing importance of mobile devices is abundantly clear, to the extent that their presence in everyday life is now taken for granted (Ling, 2012). However, as with other digital technologies, we should bear in mind that there is a "double articulation" (Silverstone & Hirsch, 1992). On the one hand, mobile devices are material objects that serve as a means of communication through which their owners are connected to the world and to other users. On the other hand, they are also cultural objects whose ubiquitous connectivity and omnipresence intimately link them to their users' daily lives, identities and social relations. Consequently, they are not only technological meta-devices with multiple functions; they also have a symbolic dimension, which gives them new social meanings based on interaction with others.

The possibilities offered by mobile communication, which frees us from the constraints of physical proximity and spatial immobility (Geser, 2004), have brought about a reconfiguration of our relationship with space and time (Ling & Campbell, 2009). Mobility is, therefore, a disruptive factor, as it introduces new paradigms into the consumption of culture and media: this consumption is no longer restricted to the domestic space and increasingly occurs in public spaces and/or during transit, thereby making spatiality a key contextual factor in the consumption experience (Peters, 2015).

The social, cultural and technological phenomenon of communication using mobile devices also presents generational differences (Ghersetti & Westlund, 2018). A large part of the study focuses on millennials, a "generation tied to their smartphones" (Mihailidis, 2014). Their phones play a key role in their daily interactions and peer socialization and enable a form of consumption that is transient, immediate, mobile and specialized (Noguera Vivo, 2018; Van Damme, Courtois, Verbrugge, & de-Marez, 2015).

With regard to patterns of information consumption, mobile devices have certain peculiarities in comparison to other platforms (Struckmann & Karnowski, 2016; Wolf & Schnauber, 2015). The consumption of news is characterized by certain habitual and heightened tendencies, such as checking, sharing, scanning, clicking and "snacking" on information (Costera Meijer & Groot Kormelink, 2015). The fact that users always carry their mobile devices with them makes it more likely that they will consume news throughout the day. Sometimes news is consumed almost unconsciously, or without specific intent. Moreover, this consumption can occur in parallel with other activities and within time intervals that are normally closed to traditional media: namely, the various interstices that form part of our daily routines (Dimmick, Feaster, & Hoplamazian, 2011).

Information that is consumed using mobile devices and apps may have been accessed via alerts and notifications. This transforms media exposure into something that is not always planned by the user, and to which he/she pays

only partial attention. In temporal terms, and to borrow the musical metaphor of Dholakia and others (2014), in contrast to the languid, continuous legato of other platforms, consumption on mobile devices is more staccato, comprised of brief and intermittent episodes that serve to provide "flashes" of information.

However, the "news snacking" that characterizes the use of mobile devices is a habit that may also have negative consequences (Molyneux, 2018). Unlike deeper, more unhurried forms of consumption, the academic literature has linked "snacking" (albeit in the form of television channel surfing or "news grazing") to a more limited awareness of public affairs and a lower level of civic engagement (Bennett, Rhine, & Flickinger 2008; Morris & Forgette, 2007).

1.2. Traits and trends in news consumption

Several studies have indicated that young people take a positive approach to news and like to stay informed (Costera, 2007; Casero-Ripollés, 2012). However, their patterns of consumption are changing, becoming more mobile and social (Yuste, 2015). They are characterized by casual or incidental access via social networks and quick, online "scanning", with traditional media only accessed in order to verify and expand information (García Jiménez, Tur-Viñes & Pastor, 2018).

This development is corroborated by data from the 2018 Digital News Report Spain. Spaniards in the 25-34 age group demonstrate a high level of interest in news: of the 293 users surveyed, 32% and 48% were "extremely interested" or "very interested" in the news, respectively. These percentages are not significantly different to those for other age groups, with the exception of those over the age of 55, from whom 58% were "very interested" in the news.

> The primary objective of this study is to describe how young people in the 25-34 age group interact with news when using mobile media, the extent to which their consumption is conditioned by the presence of advertising, and whether they are concerned about privacy. These young people are members of the so-called millennial generation because they have reached adulthood in the early years of the 21st century. Their commercial potential is of great interest to media outlets and advertisers.

With regard to the use of news sources, social media (69%), newspaper websites (54%), television programmes (50%) and print media (44%) were the predominant access routes. Although the 25-34 age group has not abandoned traditional media, Hermida and others (2012) argue that social media has become a key space for sharing, recommending and personalizing the dissemination of news, as well as simply serving as a news source. According to the Reuters Institute report, 45% of young adults access news through social networks. Other significant access routes include the search engines of specific news-oriented websites (45%), direct access via the websites of media outlets (36%), and keyword searches for a specific news story (33%).

In terms of devices, mobile phones have become young people's main gateway to the digital ecosystem. The 2018 Digital News Report Spain confirms the findings of other studies (AIMC, 2018; Fundación Telefónica, 2017) that 97% of users in the 25-34 age group recognize that mobile devices are the main gateway for accessing news. Additionally, however, 69% of users in this group still consume news via desktop or laptop computers.

1.3. Interaction with advertising and management of privacy

Regarding advertising investment in Spain (Infoadex, 2018), Internet advertising has consolidated its second-place ranking, behind only traditional media (29%). Sádaba and Sánchez-Blanco (2018) argue that its growth is due to widespread Internet use, automation, format innovations and the need to generate new sources of income.

In terms of its relationship to news consumption, Internet advertising is viewed by many users as a "toll" that must be paid in order to access content. Moreover, although advertising is a naturally occurring element within the

new ecosystem, it is often seen as negative because of how it grows indiscriminately and interrupts the browsing experience (Gálvez, 2017). This has led many users to take steps to block advertisements.

The practice of ad-blocking is no longer restricted to a minority of users, especially in the age group with which this study is concerned. Gálvez (2017) asserts that 59% of Internet users over the age of 14 are aware of ad-blockers and that 28% use them regularly. For users in the 25-34 age group, these figures increase to 73% and 45%, respectively. With regard to their reasons for doing so, more than 90% of users said that they blocked advertising to prevent loss of data speed, avoid unpleasant advertisements, and avoid the risk of getting a virus.

These usage figures are reasonably similar to those that appear in the aforementioned quantitative study. According to the 2018 Digital News Report Spain, 51% of users in the 25-34 age group have downloaded an ad-blocker at least once. This makes them the most frequent users of ad-blocking software. Some 42% are using ad-blockers currently: mostly on their computers (89%), and to a much lesser extent on their tablets (27%) and mobile phones (25%).

Although young people make extensive use of social networks as a way of finding news with a plurality of perspectives, and despite the trend towards sharing this news within their communities, young people paradoxically consider these sources too untrustworthy or biased to be used as a sole source of information. However, this study has also highlighted the use of WhatsApp for information purposes and revealed that it could even serve as the initial gateway of access to important news.

Although these users do have concerns about privacy, they still provide information in order to access services or simply to share things (Evens & Van Damme, 2016; Lee, 2016). Their willingness to share information depends on three factors: what they will receive in exchange, the extent to which they trust the company in question, and how personal the shared information is (Woodnutt, 2018). Those who are concerned about privacy take steps such as deleting their browser history, using temporary user names or email addresses, deleting apps, and adjusting the privacy settings on their devices (Lee, 2016; Meeker, 2018).

The 2016 Digital News Report Spain also explored this particular question (Reuters Institute, 2016). Specifically, it asked whether users were concerned that receiving personalized news might present a greater threat to their privacy. Spain had the third-highest percentage of respondents (54%) who stated that they shared that particular concern (Portilla, 2018). Moreover, the level of concern grew with age: amongst users in the 25-34 age group, 53% stated that they were concerned about their privacy; a similar percentage to the one for Spaniards as a whole (54%).

2. Materials and methods

Having reviewed the literature and the quantitative data mentioned above, we obtained an overview of how young people interact with news and advertising and the extent to which they are concerned about privacy. However, the following questions require further exploration:

- Why do young adults take an interest in news?
- Do they trust the traditional media for information on current affairs or do they use a diversity of sources and access routes?
- How do young adults use their devices to access news?
- What is their view on advertising? Are they aware of and/or do they use ad-blockers?
- If giving personal data is required to access news, which data are they willing to provide, and why?

In order to answer these questions, we need a qualitative study that will enable us to gain an understanding of real-world attitudes through an analysis of the discourse that this type of research generates. The study will involve particular individuals representing the 25-34 age group in Navarre who have accessed digital news, so they may be compared to the same age group within the 2018 Digital News Report Spain.

We will use the focus group technique, as it offers a greater range of approaches and focal points than if we had interviewed each individual separately.

Focus groups are a habitual feature of the qualitative methodology, as they make it possible to discern the attitudes and motivations of a particular social group and enable researchers to extract generalized principles from individual interactions (Báez & Pérez de Tudela, 2007).

As Navarre is the focal point for this study, we will first present the data on media consumption in Navarre for young people in the 25-34 age group. We will then present the results of the qualitative study, based on the participants' perceptions of their information consumption.

2.1. Media and young audiences in Navarre

According to the Media Audience Study, in 2017 Navarre was home to 73,500 people aged 25-34, from whom 72,640 (99%) had previously accessed the Internet at one time or another.

This group consumes media in all its forms. In terms of accessing online newspapers, the group also stands out from other age brackets, in light of the fact that 53% stated they had read an online newspaper the day prior to the study.

The most common digital media outlets accessed by Internet users aged 25-34 in Navarre were diariodenavarra.es (17%) and marca.com (11%). In terms of traditional media, 16% read the print version of Diario de Navarra, 10% listen to Europa FM Navarra and 16% watch Antena 3 channel. Another noteworthy statistic is that 65% of the participants had logged in to Facebook the day prior to the study.

Consequently, the ways in which young adults in Navarre consume news media are of interest to this study and justify the inclusion of this group in the qualitative study of how young people make use of media and devices, their attitudes towards advertising and privacy, and the reasons underlying their behaviour with regard to news.

2.2. Methodology

The study involved two focus groups made up of young people who lived in Navarre, aged between 25-34, and consumed digital news with a local or Navarre-oriented focus, in any format.

CIES, a company specializing in research studies and opinion polls, helped us design the methodology, recruit the participants and carry out the fieldwork. The focus groups met in separate successive sessions (at 5 p.m. and 7:30 p.m.) on Thursday 22 February 2018. Each discussion lasted two hours. There were a total of 16 participants, eight in each group, with an equal gender split (i.e., 50% women and 50% men). The mean age of the participants was 28.5.

The groups discussed five major topics: news consumption, the degree of interest in local news and media, digital media consumption, use of social networks, and advertising and personal data. The use of mobile devices was a particularly noteworthy part of the discussion.

3. Analysis and results

3.1. Interest in news

Given the scope of the study, young people are more interested in the news when they can relate to its content or when it affects them directly. In the focus groups, several participants agreed that it is important to "know what's going on the world" (male, 26) and "what's happening from day to day" (female, 34). These positions corroborated the quantitative data.

In order to explore their motives further, participants were asked about the types of the news story that interested them most. The groups made a distinction between general news and specific news. In terms of general news, several people said they were interested in social issues, cultural programs and local events "that [they] relate to" (female, 25; male, 31). Local sports content was also consumed on a recurring basis. In terms of news related to specific interests, one participant (male, 29) said he was particularly interested in information that affected him "directly".

On the whole, participants took a greater interest in the news concerning their more immediate circle or the environment. News concerning institutional politics was of less interest to some participants. As one individual (male, 27) commented, "Political news is everywhere, but I don't pay too much attention to it". However, other participants habitually kept up with political news: "Although it makes my blood boil at times, I love to follow the political news, because I like to know what's going on in the world and at home" (male, 30).

With regard to news content, we discovered another relevant factor that has a bearing on consumption: namely, the saturation that occurs when content is repeated as a result of the fact that media outlets have no further information to provide. According to one participant (male, 29), this saturation reflects the fact that certain news stories become "trendy" and therefore cause him to lose interest.

3.2. Information sources used

The quantitative study revealed that social media, media websites and television were the three news sources most frequently accessed by young people in the 25 -34 age group. Print media was relegated to the fourth position. However, when we explored this question in the focus groups, the results were somewhat contradictory. The traditional print-media brands maintained their prestige, while television was described as "sensationalist" and social media had as many detractors as it did defenders.

Nonetheless, the majority of participants said that they accessed digital media more often than traditional media because the former offered immediate access, more news stories, a broader range of perspectives and, in the words of one participant (female, 33), "more freedom to choose". If the participants happened to pick up a traditional magazine or newspaper, they would read it; otherwise, they would not. For this same reason, the traditional print-media brands the participants consumed depended on the habits of their family members, ease of access, and ideology. Some participants read newspapers because they were available at their family home: "I tend to read the paper because my parents have it delivered to our home" (female, 27). For others, reading the newspaper was an everyday habit linked to other activities: "I read the paper while I am having a coffee. I get my first glance at the news every morning in the café" (female, 34).

In general, local radio was used as a form of accompaniment. No one in the group used it as their primary source of information. Although approximately half of the participants watched television news, this trend appears to be decreasing, as three people stated that they did not watch television at all. However, for news with wide-ranging scope and impact, some did turn to the television. In the words of one participant (male, 34), "Video is the most spectacular and often the most dramatic format".

Those who defended social networks as a source of information valued their immediacy and range of perspectives, in comparison to the local press, which one participant (male, 31) described as "politicized and polarized". Another participant (male, 30) argued that "on social networks, you can follow many different media outlets, which means you will always have a complete range of perspectives". Some of the participants accessed local news via social networks (especially Facebook), received recommendations from contacts via WhatsApp, and followed events as they unfolded via Twitter. Instagram was praised as a source of sports news. Among the detractors of social media, some said they generally avoided social networks as a source of local news because they found them untrustworthy, had difficulty in establishing their credibility, and found it necessary to verify the source. "I don't like how social networks operate", said one participant (female, 27). "They manipulate everything", replied another (female, 25). However, other participants pointed out that social networks play an important role in "finding out about breaking news" (male, 29).

3.3. Access routes

Although it is not easy to identify common patterns of consumption, the participants said that they accessed news via media websites (whether directly or via search engines) and social networks; Facebook and Twitter in particular.

With regard to the latter, much of the information that was accessed originated from official media accounts that some of the participants had chosen to follow. However, news stories also appeared frequently on participants' timelines because they were posted there by their contacts. As one participant (female, 27) described it, "Suddenly, you'll see a news story that someone has shared". Some of the participants also said they found it difficult to distinguish the source of information: "[On Facebook] I follow lots of different things, and sometimes I get a little lost as to where something comes from" (female, 24).

This consumption, therefore, constitutes an "accidental exposure" to news, given that the users in question come across the information while they are online for other reasons, rather than deliberately searching for news. As one participant (female, 24) remarked, "News tends to come at you from all sides. News stories usually come to me, and if one of them piques my interest, I look up more information about it". This dynamic also extends to messaging services such as WhatsApp, which the groups cited on numerous occasions as a means of discovering news.

Moreover, access routes for news are conditioned by the urgency of the story in question and its geographical scope. Usually, the participants first found out about breaking local or regional news via WhatsApp, particularly through groups they participated in with their families and friends. To find out more, some of the participants would then access local media outlets or look up information using Google or social networks. In any case, the participants agreed that it was necessary to verify the information that they received and that the traditional media remained more credible. When the news story in question was national or international in its scope, the range of media outlets accessed by the participants became larger and was extended to include those that could dedicate more resources to news coverage.

Finally, the groups drew attention to the fact that, although their digital consumption is fragmented, it remains constant throughout the day and is arranged around temporal interstices. "I follow Diario de Navarra on all of the social networks. I check the feeds every day to see if they have been refreshed and if there are any new stories. I check them every three hours or so", commented one participant (male, 25).

3.4. Device preference

In line with the data presented in the 2018 Digital News Report Spain, the focus groups reinforced the fact that mobile phones, followed by computers, are the devices most frequently used by young adults to access news. Information consumption "almost always takes place via mobile phone, and very rarely via newspaper", remarked one participant (female, 24).

> Although young adults are interested in news, they dislike being overloaded with information, being repeatedly exposed to the same news stories, and becoming lost in the tangle of available news sources. According to our qualitative study, the ways in which young people access news is conditioned by their social and family environments, the types of activity they engage in, and their routines.

The predominance of mobile devices for accessing news means that knowledge of breaking news sometimes occurs via platforms that typically serve another purpose. One such example is instant messaging services, which become a gateway for information consumption through the user's personal contacts and groups. In the words of one participant (female, 27): "We have a group on WhatsApp, and when something attracts someone's attention, they usually share a link to the newspaper or story in question". In general, participants did not subscribe to news alerts and did not use media apps.

3.5. Perception of advertising

The participants' opinions on advertising were not very positive. "I hardly ever watch a whole ad, unless it relates to something I'm really interested in", said one participant (male, 30). Another participant (male, 31) was more explicit: "Sometimes they're very invasive because they take up the whole screen and prevent you from reading the article".

When asked about advertising based on browser cookies, the participants unanimously responded that it was "awful". As one participant (female, 27) said: "If just one ad pops up, it's not a problem. But if you lose your place on the page, then you don't know what you're clicking on, where to search, or where you are". However, this dislike of cookies bore no direct relation to the use of ad-blockers, and awareness of the existence of ad-blockers was not commonplace amongst the groups.

With regard to specific devices, advertising was found to be more annoying on mobile phones. For one participant (female, 24), it depended on which device she was using: "If I'm using my laptop, it's not an issue, because I can close the ads easily. But if I'm using my tablet or my phone, it's a lot harder". The discussion generated a more vehement response from another participant (female, 25), who stated that advertising "makes you angry".

3.6. Privacy concerns

When the participants were asked if media outlets required them to identify themselves in order to access content,

some of them said that they had signed up using their social network accounts "for the sake of convenience" (female, 34) and to avoid having to remember so many passwords. Others said that they signed up using an email address that they do not habitually access. When local media outlets required them to sign up, the participants were willing to provide a certain amount of personal information, such as their name, postcode and email address. However, they refused to provide other details, such as their postal address, telephone number, or bank account details. One participant (male, 30) said that he would only give these details "if he were a subscriber".

When discussing whether they were prepared to activate geolocation on their mobile devices, the participants generally responded negatively. They would only agree to geolocation in order to access content offered by local or regional media and to use other services, such as maps. The participants were of the opinion that certain apps recorded information without their knowledge and shared their data with third parties. This made them feel uncomfortable and as though they had given up control. In the words of one participant (female, 34), "It makes me feel a little uncomfortable to think that they can tell where you are through your mobile phone".

Some participants had experimented with personalized content and/or alerts. In general, their assessment was negative, as the media outlets in question were unable to reflect their interests. Some felt they received too many notifications and related advertising. Generic subjects did not work adequately, as one participant (male, 29) noted: "I was interested in a podcast that discussed the economic aspects of current affairs, but the filter was so broad that [...] all it did was send you ads and news stories that you'd never even think about reading".

Some participants disliked the idea of someone else pre-selecting the news stories they received. One participant (female, 27) summed it up as follows: "I scan everything, and then take a further look at what interests me". For the time being, the participants were not interested in personalized news stories.

4. Discussion and conclusions

Although young adults are interested in news, they dislike being overloaded with information, being repeatedly exposed to the same news stories, and becoming lost in the tangle of available news sources. According to our qualitative study, the ways in which young people access news is conditioned by their social and family environments, the types of activity they engage in, and their routines.

Traditional media still form part of their "information diet", given that their personal environments facilitate access to media outlets such as the press. However, they are very critical of these outlets, as they consider them to be ideologically biased. Although they describe it as "sensationalist", television remains a go-to source for important news. This was also reflected in the study conducted by Antunovic and others (2018). The 25-34 age group is, therefore, a generation that embraces digital without abandoning traditional.

Their interest increases when the content affects them directly or when they can relate to the news story in question. "Young people have an increased appetite for news" (Casero-Ripollés, 2012) and want to be informed so that they can interact with others. They appreciate immediacy, plurality, and depth in the news stories that interest them (García Jiménez, Tur-Viñes, & Pastor, 2018).

Although it is not easy to identify homogeneous patterns of consumption, there is evidence to show that young people "snack on the news, whenever and wherever they feel like it", as asserted by Dholakia and others (2014). They prefer frequent "news snacks" to regular full meals. However, prioritizing the brevity of content more than its information value may give the news media less incentive to produce quality content (Chyi, 2009; Chyi & Yang, 2009). In this respect, and as noted by Westlund (2013), and Canavilhas and Rodrigues (2017), adapting to the mobile era represents a major challenge for journalism: not only in terms of language and journalism genres but also regarding the business models adopted and user interaction.

Although young people make extensive use of social networks as a way of finding news with a plurality of perspectives, and despite the trend towards sharing this news within their communities, young people paradoxically consider these sources too untrustworthy or biased to be used as a sole source of information. However, this study has also highlighted the use of WhatsApp for information purposes and revealed that it could even serve as the initial gateway of access to important news.

Mobile phones are the device of choice, as they provide immediate access to news. Mobility makes consumption possible under a wide range of circumstances, as noted by Peters (2015) and corroborated by the focus groups. However, emerging devices such as smart TVs are beginning to gain ground among young people in the 25-34 age group, as well as amongst users in other age groups. Consequently, media outlets must make an effort to develop content and positive user experiences for smart devices (López-García, 2018).

In general, the 25-34 age group sees advertising as a nuisance, although the qualitative study showed that young people in this age group are not generally aware of or use ad-blockers. However, after they were told about the features of ad-blockers, they became interested in them. Although the 2018 Digital News Report Spain revealed that ad-blockers are mostly used with computers and have achieved very little penetration on mobile devices, the qualitative study revealed that advertising could be considered far more annoying on mobile devices than on computers. Consequently, when we argue that journalism must adapt its languages and formats to the mobile era (Westlund, 2013; Canavilhas & Rodrigues, 2017), we should bear in mind that this adaptation will also have an impact on advertising.

Young adults are willing to provide personal or geolocation data only if they receive high-quality personalized services in return and if they trusted the company in question, as noted by Woodnutt (2018) and confirmed in the qualitative study. In any case, improving personalization services and soliciting anonymous data may be two plausible alternatives for media outlets to collect useful information for their business.

In conclusion, journalism must take these new patterns of consumption into account if it wishes to continue to attract the attention of young adults and future generations. However, any action taken to achieve this must not result in poorer-quality content or misuse of advertising. A professional journalistic approach is needed in order to maintain user confidence in the media outlet's brand and to increase income by offering services that add value.

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References

AIMC (Ed.) (2018). *Marco General de los Medios en España 2018. Madrid: Asociación para la Investigación de los Medios de Comunicación*. https://bit.ly/2Dh0AET

Antunovic, D., Parsons, P., & Cooke, T.R. (2018). Checking and googling: Stages of news consumption among young adults. *Journalism*, *19*(5), 632–648. https://doi.org/10.1177/1464884916663625

Báez y Pérez-de-Tudela, J. (2007). *Investigación cualitativa*. Madrid: ESIC.

Bennett, S.E., Rhine, S.L., & Flickinger, R.S. (2008). Television news grazers: Who they are and what they (don't) know. *Critical Review*, *20*(1-2), 25-36. https://doi.org/10.1080/08913810802316316

Buckingham, D., & Martínez, J.B. (2013). Jóvenes interactivos: Nueva ciudadanía entre redes sociales y escenarios escolares. [Interactive youth: New citizenship between social networks and school settings]. *Comunicar*, *40*, 10-14. https://doi.org/10.3916/C40-2013-02-00

Canavilhas, J., & Rodrigues, C. (Eds.) (2017). *Jornalismo móvel: linguagem, géneros e modelos de negócio.* Covilhã: Editora LabCom IFP.

Casero-Ripollés, A. (2012). Más allá de los diarios: el consumo de noticias de los jóvenes en la era digital. [Beyond newspapers: News consumption among young people in the digital ra]. *Comunicar*, *20*, 151-158. https://doi.org/10.3916/C39-2012-03-05

Chyi, H.I. (2009). Information surplus and news consumption in the digital age: Impact and implications. In Z. Papacharissi (Ed.), *Journalism and citizenship: New agendas* (pp. 91-107). New York: Taylor & Francis. https://doi.org/10.4324/9780203871263

Chyi, H. I., & Yang, M.C. (2009). Is online news an inferior good? Examining the economic nature of online news among users. *Journalism & Mass Communication Quarterly*, *86*(3), 594-612. https://doi.org/10.1177/107769900908600309

CIES (2018). *Estudio de la audiencia de medios de comunicación*. https://bit.ly/2QNhHWc.

Costera, I. (2007). The paradox of popularity. How young people experience news. *Journalism Studies*, *8*(1), 96-116. https://doi.org/10.1080/14616700601056874

Costera-Meijer, I., & Groot Kormelink, T. (2015). Checking, sharing, clicking and linking: Changing patterns of news use between 2004 and 2014. *Digital Journalism*, *3*(5), 664-679. https://doi.org/10.1080/21670811.2014.937149

Dholakia, N., Reyes, I., & Bonoff, J. (2014). Mobile media: From legato to staccato, isochronal consumptionscapes. *Consumption Markets & Culture*, *18*(1), 10-24. https://doi.org/10.1080/10253866.2014.899216

Dimmick, J., Feaster, J.C., & Hoplamazian, G.J. (2011). News in the interstices: The niches of mobile media in space and time. *New Media & Society*, *13*(1), 23-39. https://doi.org/10.1177/1461444810363452

Dimock, M. (2018). *Defining generations: Where millennials end and post-millennials begin*. Pew Research Center. March, 1st. https://pewrsr.ch/2CQR87r

Evens, T., & Van-Damme, K. (2016). Consumers' willingness to share personal data: Implications for newspapers' business models. *International Journal on Media Management*, *18*(1), 1-17. https://doi.org/10.1080/14241277.2016.1166429

Fundación Telefónica (Ed.) (2017). *Sociedad digital en España 2017*. Madrid: Ariel. https://bit.ly/2lOc7RH

Gálvez, M. (2017). *La publicidad digital en manos de los usuarios: más allá del ad-blocking*. Madrid: Publicis Media y AEDEMO. https://bit.ly/2EcPTUu

García-Jiménez, A., Tur-Viñes, V., & Pastor-Ruiz, Y. (2018). Consumo mediático de adolescentes y jóvenes. Noticias, contenidos audiovisuales y medición de audiencias. *Icono 14*, *16*(1), 22-46. https://doi.org/10.7195/ri14.v16i1.1101

Geser, H. (2004). *Towards a sociological theory of the mobile phone (release 3.0)*. Zürich: Universidad de Zürich.

Ghersetti, M., & Westlund, O. (2018). Habits and generational media uses. *Journalism Studies*, *19*(7), 1039-1058. https://doi.org/10.1080/1461670X.2016.1254061

Hermida, A., Fletcher, F., Korell, D., & Logan, D. (2012). Share, like, recommend. Decoding the social media news consumer. *Journalism Studies*, *13*(5-6), 815-824. https://doi.org/10.1080/1461670X.2012.664430
Infoadex (Ed.) (2018). *Estudio Infoadex de inversión publicitaria en España 2018*. Madrid: Infoadex. https://bit.ly/2Iu9u14
Lee, L.T. (2016). Privacy: future threat or opportunity? In R.E. Brown, M. Wang, & V.K. Jones (Eds.), *The new advertising. Volume Two. New media, new uses, new metrics* (pp. 337-352). Santa Barbara: Praeger.
Ling, R. (2012). *Taken for grantedness – The embedding of mobile communication into society*. Cambridge: MIT Press. https://doi.org/10.5860/choice.50-6584
Ling, R., & Campbell, S.W. (2009). *The reconstruction of space and time: mobile communication practices*. New Brunswick: Transaction Publishers. https://doi.org/10.4324/9781315134499
López-García, X. (2018). Panorama y desafíos de la mediación comunicativa en el escenario de la denominada automatización inteligente. *El Profesional de la Información*, *27*(4), 725-731. https://doi.org/10.3145/epi.2018.jul.01
Meeker, M. (2018). *Internet Trends Report 2018*. https://bit.ly/2Nrssrz
Mihailidis, P. (2014). A tethered generation: Exploring the role of mobile phones in the daily life of young people. *Mobile Media & Communication*, *2*(1), 58-72. https://doi.org/10.1177/2050157913505558
Molyneux, L. (2018). Mobile news consumption. A habit of snacking. *Digital Journalism*, *6*(5), 634-650. https://doi.org/10.1080/21670811.2017.1334567
Morris, J. S., & Forgette, R. (2007). News grazers, television news, political knowledge, and engagement. *The Harvard International Journal of Press/Politics*, *12*(1), 91-107. https://doi.org/10.1177/1081180X06297122
Noguera-Vivo, J. M. (2018). *Generación efímera. La comunicación de las redes sociales en la era de los medios líquidos*. Salamanca: Comunicación Social.
Peters, C. (2015). Introduction. The places and spaces of news audiences. *Journalism Studies*, *16*(1), 01-11. https://doi.org/10.1080/1461670X.2014.889944
Portilla, I. (2018). Privacy concerns about information sharing as trade-off for personalized news. *El Profesional de la Información*, *27(*1), 19-26. https://doi.org/10.3145/epi.2018.ene.02
Reuters Institute (Ed.) (2016). *Reuters Institute Digital News Report*, *2016*. London. https://bit.ly/2SzV4Sa
Reuters Institute (Ed.) (2018). *Reuters Institute Digital News Report*, *2018*. London. https://bit.ly/2OrqRSG
Sádaba, CH., & Sánchez Blanco, C. (2018). El uso de bloqueadores de publicidad entre los usuarios de noticias online en España: perfiles y motivos. In J.L. González-Esteban., & J.A. García-Avilés (Coords.), *Mediamorfosis. Radiografía de la innovación en periodismo* (pp.123-136). Madrid: Sociedad Española de Periodística y Universidad Miguel Hernández de Elche.
Silverstone, R., & Hirsch, E. (1992). *Consuming technologies. Media and information in domestic spaces*. London: Routledge.
Struckmann, S., & Karnowski, V. (2016). News consumption in a changing media ecology: An MESM-Study on mobile news. *Telematics and Informatics*, *33*(2), 309-319. https://doi.org/10.1016/j.tele.2015.08.012
Van-Damme, K., Courtois, C., Verbrugge, K., & de-Marez, L. (2015). What's APPening to news? A mixed-method audience-centered study on mobile news consumption. *Mobile Media & Communication*, *3*(2), 196-213. https://doi.org/10.1177/2050157914557691
Westlund, O. (2013). Mobile news. *Digital Journalism*, *1*(1), 06-26. https://doi.org/10.1080/21670811.2012.740273
Wolf, C., & Schnauber, A. (2015). News consumption in the mobile era. *Digital Journalism*, *3*(5), 759-776. https://doi.org/10.1080/21670811.2014.942497
Woodnutt, T. (2018). *What do people really think about data privacy?… And what does it mean for brands?* https://bit.ly/2QETlOh
Yuste, B. (2015). Las nuevas formas de consumir información de los jóvenes. *Revista de Estudios de Juventud*, *108*, 179-191. https://bit.ly/2UtYYxF

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Content syndication in news aggregators. Towards devaluation of professional journalistic criteria

La sindicación de contenidos en los agregadores de noticias: Hacia la devaluación de los criterios profesionales periodísticos

Dr. Concha Edo is Professor in the Department of Journalism and Global Communication at the Complutense University of Madrid (Spain) (conchae@hotmail.es) (https://orcid.org/0000-0001-6960-867X)
Dr. Juan Yunquera is Assistant Professor in the Department of Journalism and Audio-visual Communication at the University Carlos III of Madrid (Spain) (jyunquer@hum.uc3m.es) (https://orcid.org/0000-0002-4062-1659)
Dr. Helder Bastos is Professor in the Department of Communication and Information Sciences at the University of Porto (bastos.helder@gmail.com) (https://orcid.org/0000-0002-6351-4610)

ABSTRACT

The growing expansion of Internet access and mass-scale usage of social networking platforms and search engines have forced digital newspapers to deal with challenges, amongst which are the need to constantly update news, the increasing complexity of sources, the difficulty of exercising their function as gatekeepers in a fragmented environment in which the opinions, biases and preconceptions of pundits, their followers, Twitter users, etc. has taken on a new and decisive weight and the mounting pressure to publish certain news items simply because they sell. They must also share audiences with aggregators devoted to the business of disseminating content produced by digital news publishers, blogs and RSS feeds, which is chosen on the basis of search engine algorithms, the votes of users or the preferences of readers. The fact that these computerized systems of news distribution seldom employ the criteria upon which journalism is based suggests that the work of gatekeeping is being reframed in a way that progressively eliminates journalists from the process of deciding what is newsworthy. This study of these trends has entailed a 47 point assessment of 30 news aggregators currently providing syndicated content and eight semi-structured interviews with editors of quality mass-distribution digital newspapers published in the U.S., Spain and Portugal.

RESUMEN

La creciente expansión del acceso a Internet y el uso masivo de las plataformas de redes sociales y los motores de búsqueda han obligado a los medios digitales a enfrentarse a desafíos como la necesidad de actualizar constantemente las noticias, la creciente complejidad de las fuentes, la dificultad de ejercer su función de «gatekeeper» en un entorno fragmentado en el que las opiniones, los prejuicios y las ideas preconcebidas de los expertos y sus seguidores, los usuarios de Twitter, etc. han adquirido un peso nuevo y decisivo, y la creciente presión para publicar ciertas noticias simplemente porque venden. Tienen además que compartir audiencias con agregadores cuyo negocio consiste en difundir contenido producido por editores de noticias digitales, blogs y «feeds» RSS, que hacen la selección basándose en algoritmos de búsqueda, en los votos de los usuarios o en las preferencias de los lectores. El hecho de que estos sistemas computarizados de distribución de noticias rara vez tienen en cuenta criterios periodísticos sugiere que ese trabajo de selección se está replanteando de tal manera que se va eliminando progresivamente a los periodistas del proceso de decidir lo que tiene interés periodístico. Este estudio sobre las tendencias descritas se ha llevado a cabo mediante la evaluación de 47 parámetros en 30 agregadores de noticias que actualmente ofrecen contenido sindicado, y se ha completado con ocho entrevistas semiestructuradas con editores de medios digitales de calidad y de difusión elevada publicados en los EEUU, España y Portugal.

KEYWORDS | PALABRAS CLAVE

News quality, news aggregators, media ecology, gatekeeper, journalistic ethics, digital journalism, robotics, smartphones, multiscreen society.
Calidad periodística, agregadores de noticias, ecología de medios, gatekeeper, ética periodística, periodismo digital, robótica, smartphones, sociedad multipantalla.

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1. Introduction

Journalism today entails handling a constant flow of information, taking advantage of opportunities that arise, adapting to new ways of working using tools, techniques and assumptions that weren't even possible 10 years ago, "adapting to a world where the newsmakers, the advertisers, the start-ups, and, especially, the people formerly known as the audience have all been given new freedom to communicate, narrowly and broadly, outside the old strictures of the broadcast and publishing models" (Anderson, Bell, & Shirky, 2014), and figuring out ways to engage the highly fragmented audiences (Lee-Wright, Phillips, & Witschge, 2013; Pavlik, 2008) of the post-PC era in which "if you put something in the net it actually may be easier to manage, and the PC is simply a way station along that path" (Clark, 1999). For a very long time, media outlets and journalists wielded the undisputed power to influence how audiences mentally pictured the world around them (McCombs, 2006) via messages that succinctly conveyed what matters should be perceived by the public as having overriding importance. Both have routinely operated under the assumption that their primary mission was "to provide citizens with the information they need to be free and self-governing" (Kovach & Rosenstiel, 2014). Journalism has nevertheless evolved into a service rendered to an informed public (Jarvis, 2013) accustomed to accessing information via electronic devices that may function well as vehicles for delivering and accessing news content, but they also induce readers to spend more and more time in a commercially charged environment that reduces their capacity to reflect and think critically and whose potentially anesthetizing effect (Brottman, 2005) may even alter their cognitive processes (Carr, 2010).

The popularization of the Internet and the public's extensive use of social networking platforms and search engines on a massive scale have forced digital newspapers to deal with the challenges posed by: the need to update content; the increasing complexity of sources; the difficulty of exercising their function as gatekeepers in a fragmented environment; and the mounting pressure to publish certain news items merely because they sell (Boczkowski, 2004; Deuze, 2006, 2007; Domingo, Quandt, Heinonen, Paulussen, Singer, & Vujnovic, 2008; Kapuscinski, 2005; Pavlik, 2001) in a fragmented and increasingly competitive market that everyone seems determined to enter (Holzer & Ondrus, 2011). Pavlik (2013) asserts that the survival of news agencies during this period of upheaval hinges on their commitment to innovation and rigorous adherence to four basic principles: intelligence or research, a commitment to freedom of speech, a dedication to the pursuit of truth and accuracy in reporting, and ethics, whereas other authors such as Kunelius (2006) or Kovach and Rosenstiel (2007) stress the importance of maintaining the self-critical perspective crucial to ensuring the content they offer continues to be relevant in the eyes of the public.

Given the impossibility of accurately predicting the mid- and long-term future of journalism, this study attempted to determine whether news aggregator apps used by readers to create smart, personalized magazines are useful or detrimental to the values of journalism (McBride & Rosenstiel, 2013; Kunelius, 2006; Kovach & Rosenstiel, 2003). Studies published about mobile devices have tended to approach them from technological angles (Lavin, 2015; Enck, Gilbert, Chun, Cox, Jung, …Sheth, 2010; Aguado, Feijóo, & Martínez, 2013; Yang, Xue, Fang, & Tang, 2012; Falaki, Mahajan, Kandula, Lymberopoulos, Govindan, & Estrin, 2010; Canavilhas, 2009; Law, Fortunati, & Yang, 2006; Souza e Silva, 2006), but less scholarly attention has been paid to apps, which offer new opportunities but may or may not prove to be the silver bullet in terms of distribution that many have predicted they will be. Much of the research conducted on the impact that aggregator giants such as Google and Yahoo have had on journalism has focused on the "business-stealing effect" often associated with them (Lee & Chyi, 2015; Jeon & Nasr, 2014; Quinn, 2014; Dellarocas, Katona, & Rand, 2012; Isbell, 2010) and paid less attention to smaller sector players channelling syndicated content to millions of readers via apps-enterprises that are causing far fewer problems for the production end of the news industry and fall neatly in line with the theory of disruptive innovation developed at the Harvard Business School (Christensen, & Skok, 2012). The majority of these companies use software to scan and index Internet news systematically, and though a few also employ human editors, the content they vet is determined by algorithms (Diakopoulos, 2014).

These smaller news aggregators, whose approach has different characteristics from others of larger dimensions such as Google (Athey, Mobius, & Pal, 2017) or Facebook (De-Corniere & Sarvary, 2017), offer a transversal reading of the informative landscape of the internet that facilitates adaptation to different user profiles (Aguado & Castellet, 2015). And they select news by means of algorithms related to the search systems of the browsers with choice or voting by the users or by the customized thematic selection of the readers. They are not included in large groups such as Google News, Apple News, Snapchat Discover, Kakao Channel or Line News, but they are independent products from the business perspective (Newman, Fletcher, Kalogeropoulos, Levy, & Nielsen, 2017). They collect information from cyber media, blogs, and subscriptions to feeds (channels or RSS feeds) of

Twitter, Facebook, Google+, LinkedIn, Instagram, Flickr or YouTube, and their business consists of generating value among readers and media. However, as yet their financing model is unclear, and it is still rare for users to pay for access. They usually offer a link to the original article with the added advantage that they can sell that information and publicize themselves without having to produce their own content. At the same time, however, in many cases, they prevent those who produced the content from obtaining the corresponding benefits. Thus, they have a negative aspect: they can limit access to the original website by the aforementioned business-stealing effect, but there is also another positive aspect as they increase visibility and traffic exponentially through the market-expansion effect; and both can be calculated quantitatively using the number of visits by users (Nars & Jeon, 2014). Media ascertains that with this second effect, news traffic increases and, from the readers' perspective, there is a greater diversification of contents (De Corniere & Sarvary, 2017). If we look at the market substitution effect though, it can be shown that a large number of these readers never look at the original article, or they do not go into any depth (Chiou & Tucker, 2017), and consider the information in the aggregators to be sufficient, which then become unfair competitors of news producers and may even offer their content in a biased manner (Hamborg, Meuschke, Aizaba, & Gipp, 2017).

Jeon and Nasr factored an additional consideration drawn from a previous study conducted by Dellarocas, Katona and Rand (2016) into their analysis of the relative strengths of market expansion and market substitution effects, which was the way in which hyperlinking may raise or lower digital publications' incentives to produce quality content –an issue worth exploring given the possibility that the boon aggregators offer consumers may constitute a bane for content producers–. The difference between loyal, paying news consumers and others looking for free, quality content via aggregator sites should also be taken into account. As the number of people cruising the Internet for free news content continues to grow, and the number of individuals demanding quality grows with it, aggregators may need to adjust their strategies in order to satisfy readers in search of both quantity and quality (Rutt, 2011). Authors who have found the market-expansion effect to be the most pervasive have concluded that news aggregators complement the news sources they draw content from (Athey & Mobius, 2017; Chiou & Tucker, 2012). Others have observed that, in the context of two-sided media markets, the presence of news aggregators drives up the number of multi-homing readers, and overall sector advertising revenues tend to be lower in environments in which a large percentage of news consumers are single-homing readers (George & Hogendorn, 2012, 2013). Jeon and Nasr have also focused on the dynamics of two-sided markets (2014).

> Generally speaking, the aggregators analysed disseminate content via apps that allow them to offer a vast quantity of new items that they nevertheless fail to organize and prioritize in accordance with journalistic standards. In light of the quantitatively oriented content selections examined, which in certain instances fell into the category of superficial eye candy, we believe that their model of news distribution needs to be reoriented towards higher quality content and that gatekeeper competences in what is now a diverse and changing sector must be reformulated.

Perhaps, the real clash between aggregation and journalism lies not only in the work of one or the other, nor in the possibility that each one defines the other as a kind of pathological doppelganger, but also in the type of elements with which they build their stories and in the criteria they use for fact-checking Anderson (2013) and "the great conflict over journalism may be centred around the things of journalism in addition to the work of journalism or their definition". This is, beyond questions related to audience share and dominant models of consumption, there is the pressing need to determine the validity of assertions made by authors such Mills, Egglestone, Rashid and Vaastäjä (2012) that the trivialization of news is becoming progressively more evident. The fact that journalistic criteria play no part in the processes by which most aggregators select and display news content leads one to suspect that journalism's role as the gatekeeper of news is being seriously compromised or may already be a thing of the past. As

Christensen and Skok (2012) have pointed out, BuzzFeed has started to produce its own branded content. Gatekeeping has long been a critical part of journalism's identity (Bordieu, 2005), and journalists have always claimed to have a unique responsibility and capacity for deciding what constitutes news –a longstanding notion that soon may need to be renegotiated given the shaky foundations on which it currently stands– (Vos & Finneman, 2016). In any case, the competitive relationship between news producers and aggregators needs to be examined in depth, for as Lee and Chyi (2015) have pointed out, "content aggregation is here to stay".

2. Material and methods

In light of the complexity of the situation described above, we posed the following research questions concerning the smaller app-driven aggregators serving the market today: Q1: Do they organize the content they offer in terms of established journalistic practice or in a way that may confuse readers?; Q2: Are the selection criteria that they employ transparent, or do they correspond to marketing interests?; Q3: Do they employ journalists as fact-checkers or curators, or do they shun the role of gatekeeper?

The primary objective of the research reported here is to gauge if the expansive contribution of these aggregators offers a professionalized journalistic selection of the news, or does it have a merely quantitative approach. This is important to understand given the pressing need to defend models of journalism based on excellence against the encroachment of others that place a higher value on traffic over the relevance of content published. In journalistic and academic fields, it is already considered that a growing emphasis on audience capture is one of the main factors contributing to the gradual decline in the quality of news content so evident today, but "pleasing the audience might be compatible with producing excellent journalism" (Costera, 2013) and the entrance of the aggregators raises a new academic and professional discussion. There are ethical parameters such as linking to the original material, attributing the content to the author, verifying information and providing added value (Buttry, 2012). Others stress that responsible aggregation should not confuse readers, but it should identify the origin, link to the publisher and include only a paragraph to encourage the search for the original (Friedman, 2014). There are also positive opinions that consider them a way to achieve higher quality content (Jeon & Nars, 2016), and others that distinguish between symbiotic aggregators and parasites, using four evaluative elements: attribution, limited use, added value and right of rejection by the publishers (Bailey, 2015).

In this context, we posed two hypotheses: 1) App-driven aggregators deliver vast quantities of content that they nevertheless fail to organize and prioritize in a manner that could be considered professional from a journalistic point of view. 2) Aggregators would have a greater value for the increasing well-informed and demanding reader-users of today if they placed a higher priority on the quality of the content they offered instead of focusing all their energy on identifying audiences most likely to be best targets in terms of monetization.

To carry out the research on these new proposals, quantitative and qualitative aspects have been taken into account, which are reflected in the analysis sheet that has been applied to each of the selected samples and we have compiled different models of aggregator apps that seem stable at the moment, but assuming the impossibility of offering an exhaustive list since some have a short life, new ones emerge immediately and many act from the web and do not have an app. There are different types of horizontal or generalist social bookmarkers to store and share information in different languages, frequently operating from their own website and some are inspired by the Anglo-Saxon "Digg" (2004), which we selected for study as besides being a pioneer in this field it offers news and has an app. Other examples are "Delicious" (2003), "Blogmarks" (2003), "Menéame" (2005), "Bitácoras" (2010) and "StumbleUpon" (2010). Vertical and specialized social bookmarking systems include the video-sharing site "Vimeo" (2004); "TechCrunch" (2005), which offers tech news; "Mktfan" (2009), specializing in marketing and digital technology; "Imgur" (2009), a photo sharing site chosen for the study sample; "Tech News Tube" (2011); "Divúlgame" (2011); "iGeeky" (2011), which is focused on RSS feeds; "Tech News by Newsfusion" (2012), which offers news about Apple, Facebook and startups; "AppyGeek" (2012), a highly popular tech news app; "Product Hunt" (2013), which focuses on new tech products; and "TechPort" (2013), which also offers tech-focused content.

Personalized social magazines make up another large group of aggregators that offer news and social network content in a magazine format that users can customize and which are active or passive depending on the levels of selection allowed to the reader. Their business is based on monetizing user data, which is not sold to third parties but is used in processes related to advertising, and they accept both conventional and sponsored advertising. Aggregators of this type include "Feedly" (2008), "NewsBlur" (2009), "Flipboard" (2010), "Reeder 3" (2010), "Inoreader" (2012), "News App" (2012), and "Play Kiosko" (2013). Others, which tend to pursue a paid content

model, work with syndicated content services, include "Popurls" (2005), "Newsify" (2012), "LinkedIn Pulse" (2013), "Feed Wrangler" (2013), "Unread" (2014) and "News Republic" (2014). "Fark" is launched in 1999 that released an app in 2012 that was most recently updated in 2017. A more recent generation that has improved the concept includes "Scoop.it!" a Web curation platform launched in English in 2011 that has since added Spanish; "Smart News" (2012); "Blendle" (2013), a Dutch pay-as-you-go news platform described as "iTunes for news"; "Paper.li" (2009), an app that reconfigures Twitter and Facebook streams into a newspaper format; "News360" (2010), a personalized news aggregator app that "learns" to detect content of interest to users; and "UpDay" (2015), an app developed by Axel Springer and Samsung. Others are "inkl" (2015), which offers a curated selection of news content; "Feedbin" (2015); "NewsBot" (2015), originally named Telme John); "Mosaiscope" (2012), a comprehensive news aggregator/reader; "Readzi" (2016); "Nuzzel" (2016), a personalized news app classified as one of best apps of 2016 and "Read Across the Aisle" (2017), an app designed to help readers escape from their personal filter bubbles. Other options worth noting are "Reddit" (2005); "Pocket" (2007) that is useful for storing website content; "Instapaper" (2008), which was acquired by Pinterest in 2016; "JimmyR" (2006), which could be considered more of a mashup; "Diigo" (2014); "Revoat" (2015), which is similar to Reddit but offers more opportunities for user engagement and is less strict about politically incorrect content; website aggregator "Netvibes" (2005) and "StumbleUpon" (2001), a discovery engine acquired by eBay in 2007 that searches for and recommends news and other types of content of interest to users. Some of these can be considered fusions between bookmarking services and aggregators.

For the purposes of this study, we examined a sample of thirty aggregator apps selected from the almost endless list being marketed today. Data related to the business model is not what we consider most relevant, and if taken into account, it can be seen that, for the most part, they are not journalistic companies nor is their purpose quality of information. They rely on technology to generate traffic and a volume of unknown users who do not generate advertising revenue or subscribers and which hurt publishers. Although our main inclusion criterion was that an app is devoted entirely (or at least partially) to news content, we also took into consideration other points such as the size of their user bases, level of interactivity, user-friendliness, novelty and the frequency with which they were updated. In light of the fact that newspapers generate the content aggregators use, in addition to working with data obtained from an analysis of this sample, we also conducted a series of semi-constructed interviews with the editors of "The Washington Post", "The Wall Street Journal" (U.S.), "El País", "El Mundo", "ABC", "El Confidencial" (Spain), "Público", and "Jornal de Noticias" (Portugal). In order to better examine the structure and models of the aggregators selected for the study sample, once our review of the existing literature was complete, we prepared an analysis sheet containing 47 evaluation parameters related to four key areas of inquiry (see Table 1).

Table 1. Parameters

Description	1. Name 2. Developer 3. URL 4. Type of company 5. No. of employees 6. Year of launch and date of latest version 7. Free/paid (price) 8. System/platform 9. Language 10. Usable offline?
Navigation and structure	1. Description of user tasks 2. Does it offer multi-window navigation? 3. Description of content hierarchy 4. Ease of use 5. Accessibility 6. Presence of staff journalists 7. Automatic selection 8. Selection by journalists 9. Selection by others 10. Selection criteria.
Contents	1. Homepage 2. Fixed/variable. 3. Does it feature a "front page"? 4. No. of news stories/no. of pages 5. Direct links to original sources 6. Sections 7. Updating frequency 8. No. of links per section 9. Types of links (conventional media, social networking sites, public and other entities, etc.) 10. Archive 11. Does it offer exclusive content? 12. Is content prioritized? If so, according to what criteria?
Interactivity	1. Identification 2. Topic selection system 3. Possibility of posting comments 4. Content sharing option 5. Options for uploading one's own content 6. Possibility of displaying content on a personal social networking profile 7. Privacy 8. Legal notice 9. Search engine? 10. Possibility for users to curate content 11. Possibility of posting comments 12. Possibility of creating a user account 13. Push notifications for breaking news on topics that readers have indicated 14. Geolocation 15. Access via various types of devices.

3. Results

Description: They are companies that never exceed 50 employees, and with free apps that have paywalls. They

usually publish in English but also in other languages. There are two categories: a) Aggregators with a predominance of marking feeds based on the preferences of users and which focus investment on technological development in order to make an automatic selection using algorithms. They have between two and five employees; b) Aggregators with editing teams that select information for more personal consumption, employing from ten to fifty people.

Navigation and structure: Those that select based on the of users votes have a linear, minimalist, scroll structure with information in steps for an unbroken visualization. Others, such as "Flipboard" or "Feedly", are Custom Social Journals with a design similar to that of printed magazines, very visual and with page flipping. In the majority the user personalizes and determines the list of media, the user experience is usually easy, and they are very intuitive, with exceptions such as "Mosaiscope".

Contents: The presentation of information is done as on the web, without covering and ranking the latest news, except "Flipboard". There is no daily edition, the number of items of news is updated continuously, and the number of links is also undefined. Most are horizontal and connect with conventional media, but others use social networks, entities, and blogs vertically. The selection is based on the date of entry, the relevance of the contacts or thematic selection; and content is added by vote of the users and the frequency of feeds and algorithms of the site.

Interactivity: There are many similarities with minimal differences. The technological tools are practically similar in all the apps, and they vary in functionalities, such as giving opinions, commenting or contributing, which are usually done through Facebook or Twitter. All have the option of sharing and including profiles on social networks.

The Table 2 provides data for the primary objectives of this study.

Findings indicate that the content selection processes employed by most app-based aggregators are algorithmically driven, quantitatively oriented and unprofessional from the perspective of journalistic standards. The newspaper editors and executives interviewed for this study all complained that aggregators make unfair use of the content they produce, and they believed that a more equitable arrangement needed to be negotiated. All of them reflect, with the exception of "El Confidencial", two attitudes: they assume that they must inevitably accept the new situation but, at the same time, they state that aggregators do not support or favour news publishers without whom their business would cease to exist. If these platforms bring them more readers, they are not against them. But they consider that the current model means they will lose profitability and that if an adequate method of collaboration is not reached, audiences may assume that information is free when the reality is that it requires good professionals, ethical and deontological guarantees and considerable economic investment.

Table 2. Data table

Apps	Languages	Hierarchy criteria	Staff journalists	Automated selection
AppyGeek	46	No/ Determined by user	No	Yes
Blendle	3	Sections/ Determined by user	Yes	Only "partners"
Digg	English	Quantitative	Yes	Yes
Fark	English	Date	No	Yes
Feedbin	English	Date/ # of Clicks	No	Yes
Feedly	English	By category (in Today section only)	Yes	Yes
Flipboard	12	Yes	Yes	Yes
Google Play	47	Google suggestions	Yes	Yes
Imgur	English	Date/ # of Clicks	No	Yes
Inkl News	English	Yes/ user filters	Yes	Yes
Inoreader	English	Date/ # of Clicks	No	Yes
Mosaiscope	English	Date/ Determined by user	No	Yes
Netvibes	English	Date	No	Yes
News 360	2	Determined by user	No	Yes
News App	10	Date	No	Yes
NewsBlur	13	Determined by user	No	Yes
NewsBot	3	Date	No	Yes
News Explorer	English	Filters/Determined by user	No	Yes
Newsify	English	Determined by user	No	Yes
News Republic	37	Sections/Determined by user	No	Yes
Nuzzel	31	# of shares/Hourly	No	Yes
Popurls	34	Most recent feeds	No	Yes
ProductHunt	English	Date	No	Yes
Reeder 3	English	Determined by user	No	Yes
Reddit	English	Determined by user	No	Yes
ReadAcross	5	Date	No	No. Based on user preferences
Scoop.it	English	Determined by user	No	Yes
SmartNews	2	Media algorithm-driven	No	Yes
Snatz	English	Algorithm-driven	Yes	Yes
Unread	English	Most recent	No	Yes

Emilio García-Ruiz, managing editor of "The Washington Post",

asserted that everything has changed; and refusing to work with Google is bucking a revolution. While he has no problem with small-scale aggregators that generate new readers, he considers their prospects dim in a sector in which only enterprises capable of attracting mass audiences survive. Constance Mitchell-Ford, a veteran "The Wall Street Journal" editor, asserted that digital newspapers who are unhappy with the fact that aggregators provide free content need to develop similar distribution mechanisms that readers are willing to pay for. "There are many readers who just want to read headlines and general, superficial news and don't ask for anything more. They get that for free. But there are lots of others that expect quality and need analysis and coverage that requires investigative work, which is something that must be paid for. Free news is a really nice idea, but somebody along the line has to pay what it costs to produce it".

Referring to the love-hate relationship that exists between newspapers and aggregators, Bernardo Marín García, deputy director of digital operations at "El País", reflects, "It's true that they cherry pick our work. But they also allow us to reach many more readers". "El Mundo's" deputy director Rafael Moyano is less optimistic. "We are now in their hands", he laments. "Newspapers do the work, and they take a free ride. For the moment they need us, and they're beginning to realize that they can't go on doing what they're doing indefinitely". Montserrat Lluis, deputy director of "ABC" feels that the methods app-based aggregators use to select news content are rigged to "rob us of the greatest number and best news stories possible". From her perspective, "This is a travesty driven by an obsession with winning an ever-greater slice of a readership pie that should be more equally distributed between aggregators and newspapers so as to ensure the quality of journalism going forward. Letting the public become accustomed to the notion that news is free and professional and ethical standards are irrelevant is dangerous". Nacho Cardero, the editor of "El Confidencial", who takes the position that aggregators allow his paper to reach a larger audience, describes them as "our allies, not our enemies". As far as he is concerned, the problem lies with editors "who haven't yet learned how to monetize their newspapers or stubbornly cling to bloated, completely anachronistic operational structures".

While Domingos de Andrade, executive director of "Jornal de Notícias", worries that aggregators could well be the death sentence for newspapers, he also recognizes that without them newspapers would find it harder to connect with audiences. According to him, "The question is how we newspapers can become profitable on the basis of the simple fact they are using content we produce". As Amílcar Correia, the executive editor of "Público", sees it, "Aggregators are unjustifiably distributing free content to more and more readers and they should be paying to do that. They may have funded research projects in Europe to clear their conscience, but even the smallest of them siphon off-market segments that could be crucial to given news publications. In any case, newspapers are free to prevent them from aggregating their content".

4. Discussion and conclusions

News aggregation is a complicated and competitive business in which very few players manage to survive, and most have only short-term viability. It is equally controversial in the light of assertions made by newspapers in numerous countries that aggregators should have to pay for the snippets of news articles they feature. Good journalism is expensive to produce, and without the quality content that newspapers generate, news aggregators would have nothing of value to "sell". Although these businesses may be competing with newspapers, and despite the fact that they make their money from the content they do not produce themselves, the two must coexist and eventually arrive at some mutually acceptable modus vivendi.

Aggregators have various points in their favour: a) They make a vast quantity of news and information easily accessible and offer a high level of personalization; b) They allow busy, active users interested in staying constantly up to date to set their own personal news agendas; c) They allow local and specialized publications that would otherwise remain below the radar to reach vast new audiences; d) They dramatically improve the national and international visibility of and access to a broad spectrum of digital publications and their content; e) They open up new business opportunities for news organizations that generate rapid revenue for those that learn how to exploit them successfully.

They nevertheless have their downsides as well: a) As it is impossible to wade through the vast volume of content they offer, and this unmediated surfeit of news can quickly devolve into a dearth of information, users must spend time learning how to organize their feeds and reduce their sources to a manageable number if they don't want to be perpetually overwhelmed; b) Aggregators' methods of content selection, most of which are focused on automated, random searches and based on user preferences and advertising considerations, are not professional

from a journalistic perspective; c) Their modus operandi disrupts the relationship between readers and news organizations; d) The proliferation of these increasingly technologically advanced platforms is causing ever-deeper fractures in a saturated market in which fragmented audiences use various products simultaneously.

Findings support our starting hypotheses. Generally speaking, the aggregators analysed disseminate content via apps that allow them to offer a vast quantity of new items that they nevertheless fail to organize and prioritize in accordance with journalistic standards. In light of the quantitatively oriented content selections examined, which in certain instances fell into the category of superficial eye candy, we believe that their model of news distribution needs to be reoriented towards higher quality content and that gatekeeper competences in what is now a diverse and changing sector must be reformulated. Aggregators would have a higher value for the increasing well-informed and demanding readers of today if they used journalistic methods of content selection and prioritization instead of focusing their energy on identifying which audiences are likely to be the best targets in terms of monetization. Although these services offer easy access to a wide range of news stories and a high level of personalization, their failure to organize content professionally contributes to fragmentation that impedes users from localizing specific sources and gaining a comprehensive understanding of issues and events. All should, therefore, make a more significant effort to impose a hierarchy on the content they offer. It is also time to bring our concept of what a gatekeeper is and needs to do in line with the circumstances of today's technology, journalistic practices, communications, and current news models.

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References

Aguado, J.M., Feijóo, C., & Martínez, I.J. (2013). *La comunicación móvil*. Madrid: Gedisa.

Anderson, C., Bell, E., & Shirky C. (2014). *Post-Industrial journalism. Adapting to the present*. *Columbia University Library*. Series: Tow Center for Digital Journalism Publications. https://doi.org/10.7916/D8N01JS7

Anderson, C.W. (2013). What aggregators do: Towards a networked concept of journalistic expertise in the digital age. *Journalism 14*(8), 1008-1023. https://doi.org/10.1177/1464884913492460

Athey, S., Mobius, M., & Pal, J. (2017). *The impact of news aggregators on Internet news consumption. Working paper 3353*. Graduate School of Stanford Business. https://stanford.io/2QVYyhj

Bailey, J. (2015). A brief guide to ethical aggregation. *Plagiarism Today*. https://bit.ly/1QI1g9l

Boczkowski, P. (2004). *Digitizing the news. Innovation in online newspapers*. Cambridge, Massachusetts: The MIT Press. https://doi.org/10.7551/mitpress/2435.001.0001

Bourdieu, P. (2005). The political field, the social science field, and the journalistic field. In R. Benson, & E. Neveu (Eds.), *Bourdieu and the journalistic field* (pp. 29-47). Cambridge: Polity Press.

Brottman, M. (2005). *High theory / Low culture*. New York: Palgrave MacMillan. https://doi.org/10.1057/9781403978226

Buttry, S. (2012). Aggregation guidelines: Link, attribute, add value. *The Buttry Diary*. https://bit.ly/1C1qalT.

Carr, N. (2010). *The shallows: How the Internet is changing the way we think, read and remember*. London: Atlantic Books.

Castellet, A., & Aguado, J.M. (2015). Innovar cuando todo cambia. El valor disruptivo de la tecnología móvil en la industria de la información. *Sur le Journalisme, About Journalism, Sobre Jornalismo, 3*(2), 26-39. https://bit.ly/2PG9Epi

Chiou, L., & Tucker, C. (2012). Copyright, digitization, and aggregation, discussion paper. *NET Institute Working Paper*, 11-18. https://doi.org/10.2139/ssrn.1864203

Chiou, L., & Tucker, C. (2017). Content aggregation by platforms: The case of the news media. *Journal of Economics Management Strategy, 26*(4), 782-805. https://doi.org/10.3386/w21404

Christensen, Clayton & Skok, David (2012). Be the disruptor. *Nieman Reports, 66*(3). https://bit.ly/2Eshhhl

Clark, D. (1999). *Post-PC Internet. MIT Computer Science and Artificial Intelligence Laboratory*. Talk at the LCS 35th celebration, April 13. https://bit.ly/2UOUdyV

Costera, I. (2013). Valuable journalism: A search for quality from the vantage point of the user. *Journalism. 14*(6), pp. 754-770. https://doi.org/10.1177/1464884912455899

De Corniere, A., & Sarvary, M. (2017). Social media and the news industry. *NET Institute Working Paper*, 17-07. https://doi.org/10.2139/ssrn.3049358

Dellarocas, C., Katona, Z., & Rand, W. (2012). Media, aggregators and the link economy: Strategic hyperlink formation in content networks. *NET Institute Working Papers* 10-13. https://doi.org/10.1287/mnsc.2013.1710

Deuze, M. (2006). O jornalismo e os novos meios de comunicação social. *Comunicação e Sociedade, 9(10), 15-37*. https://doi.org/10.17231/comsoc.9(2006).1152

Diakopoulos, N. (2014). Algorithmic accountability. Journalistic investigation of computational power structures. *Digital Journalism, 3*(3), 398-415. https://doi.org/10.1080/21670811.2014.976411

Domingo, D., Quandt, T., Heinonen, A., Paulussen, S., Singer, J.B., & Vujnovic, M. (2008). Participatory journalism practices in the media and beyond. *Journalism Practice*, *2*(3), 326-342. https://doi.org/10.1080/17512780802281065
Enck, W., Gilbert, P., Chun, B.G., Cox, L., Jung, J., … Sheth, A. (2014). TaintDroidt: An information-flow tracking system for realtime privacy monitoring on smartphones. *ACM Trans. Comput. Syst. (TOCS) 32*(2), 5. https://doi.org/10.1145/2619091
Falaki, H., Mahaja, R., Kandula, S., Lymberopoulos, D., Govindan, R., & Estrin, D. (2010). Diversity in smartphone usage. MobiSys '10. *Proceedings of the 8th International Conference on Mobile Systems, Applications and Services* (pp. 179-194). San Francisco. https://doi.org/10.1145/1814433.1814453
Friedman, A. (2014). We're all aggregators now. So we should be ethical about it. *Columbia Journalism Review.* May, 23. https://bit.ly/2EpH7Cq
George, L., & Hogendorn, C. (2012). Aggregators, search and the economics of new media institutions. *Information Economics and Policy, 24*(1), 40-51. https://doi.org/10.1016/j.infoecopol.2012.01.005
Hamborg, F., Meuschke, N., Aizawa, A., & Gipp, B. (2017). Identification and analysis of media Biasin News Articles. In M. Gäde, V. Trkulja, & V. Petras (Eds.), Everything changes, everything stays the same? Understanding information spaces. *Proceedings of the 15th International Symposium of Information Science (ISI 2017) (*pp. 224-236). Berlin, 13th-15th March 2017. Glückstadt: Verlag Werner Hülsbusch. https://doi.org/10.1163/9789004319523_015
Holzer, A., & Ondrus, J. (2011). Mobile application market: A developer's perspective. *Telematics and Informatics, 28*, 22-31. https://doi.org/10.1016/j.tele.2010.05.006
Jarvis, J. (2013). *There are no journalists. Buzz machine.* https://bit.ly/2fWEdoX
Nasr, N., & Jeon, D.S. (2014). News aggregators and competition among newspapers in the Internet. *TSE*, 12-20. https://doi.org/10.2139/ssrn.2164396
Kapuscinki, R. (2005). *Los cinco sentidos del periodista*. Colombia, Spain: Fundación Nuevo Periodismo Iberoamericano, Asociación de la Prensa de Madrid.
Kovach, B., & Rosentiel, T. (2014). *The elements of journalism.* New York: Three Rivers Press. Crown Publishing Group. Random House LLC.
Kunelius, R. (2006). Good journalism. *Journalism Studies, 7*(5), 671-690. https://doi.org/10.1080/14616700600890323
Lavin, A., & Gray, S. (2016). Fast algorithms for convolutional neural networks. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*. https://doi.org/10.1109/cvpr.2016.435
Law, P., Fortunati, L., & Yang, S. (2006). *New technologies in global societies.* River Edge, NJ, USA: World Scientific Publishing. https://doi.org/10.1142/9789812773555
Lee, A., & Chyi, H. (2015). The rise of online news aggregators: Consumption and competition. *The International Journal on Media Management*, *17*(1), 3-24. https://doi.org/10.1080/14241277.2014.997383
Lee-Wright, P., Phillips, A., & Witschge, T. (2013). *Changing Journalism*. USA: Routledge.
McBride, K., & Rosenstiel, T. (Eds.) (2014). *The new ethics of journalism: A guide for the 21st century*. Los Angeles: SAGE.
McCombs, M. (2006). *Estableciendo la agenda. El impacto de los medios en la opinión pública y el conocimiento.* Barcelona: Paidós.
Mills, J., Egglestone, P., Rashid, O., & Väätäjä, H. (2012). MoJo in action: The use of mobiles in conflict, community and cross platform Journalism. *Continuum*, *26*(5), 669-683. https://doi.org/10.1080/10304312.2012.706457
Nasr, N., & Jeon, D.S. (2014). News aggregators and competition among newspapers in the Internet. *TSE*, 12-20. https://doi.org/10.2139/ssrn.2164396
Newman, N., Fletcher, R., Kalogeropoulos, A., Levy, D., & Nielsen, R. (2017). *Reuters Institute digital news report 2017.* Oxford: Reuters Institute for the Study of Journalism. https://bit.ly/2R3kNVS
Pavlik, J. (2013). Innovation and the future of journalism. *Digital Journalism*, *1*(2), 181-193. https://doi.org/10.1080/21670811.2012.756666
Pavlik, J. (2008). *Media in the digital age.* New York: Columbia University Press.
Pavlik, J. (2001). *Journalism and new media*. New York: Columbia University Press. https://doi.org/10.7312/pavl11482
Rosentiel, T., Jurkowitz, M., & Ji, H. (2012). *The Search for a new business model*. Pew Research Center. Journalism & Media. https://pewrsr.ch/2R0TOdD
Rutt, J. (2011). Aggregators and the News Industry: Charging for access to content. *NET Institute. Working Paper,* 11-19. https://doi.org/10.2139/ssrn.1958028
Souza-e-Silva, A. (2006). Mobile technologies as interfaces of hybrid spaces. *Space and Culture*, *9*(3), 261-278. https://doi.org/10.1177/1206331206289022
Stivers, C. (2012). *Aggregated assault. Whose work is it, anyway? A plea for standards.* Columbia Journalism Review, may-june. https://bit.ly/2rGwX90
Vos, T.P., & Finneman, T. (2017). The early historical construction of journalism's gatekeeping role. *Journalism*, *18*(3), 265-280. https://doi.org/10.1177/1464884916636126
Yang, D., Xue, G., Fang, X., & Tang, J. (2012). Crowdsourcing to smartphones: Incentive mechanism design for mobile phone sensing. *18th Annual International Conference on Mobile Computing and Networking*, August 22, 2012 / August 26, 2012, Istanbul, Turkey, pp. 173-184. https://doi.org/10.1145/2348543.2348567

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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

Dr. Lidia-E. Santana-Vega is Full Professor in the Department of Teaching and Educational Research at the University of La Laguna (Spain) (lsantana@ull.es) (https://orcid.org/0000-0002-2543-6543)

Ana-María Gómez-Muñoz is Researcher in training in the Department of Teaching and Educational Research at the University of La Laguna (Spain) (alu0101075426@ull.edu.es) (https://orcid.org/0000-0001-7993-4807)

Dr. Luis Feliciano-García is Professor in the Department of Teaching and Educational Research at the University of La Laguna (Spain) (lfelici@ull.edu.es) (https://orcid.org/0000-0002-2909-4990)

ABSTRACT

This research analyzes the problematic use of mobile phone, the phenomenon of Fear of Missing Out (FoMO) and the communication between parents and children in students who attend secondary education in public and private centers of the regions of Canary Islands, Balearic Islands and Valencia. The research involved 569 students aged between 12 and 19 years. The instruments used were the "Mobil phone related experiences questionnaire", the Spanish adaptation of the "Fear of Missing Out Questionnaire" and the communication dimension with parents of the "Parents and peers attachment inventory". The results show that: 1) An increased problematic use of the mobile phone is associated with a higher level of FoMO; 2) The students who frequently use the mobile phone and communicate more with their friends have a higher average score in the "Mobile phone related experiences questionnaire" and in the "Fear of Missing Out Questionnaire"; 3) The students that use the mobile phone for less time has a greater communication with fathers and mothers. We discuss the relevance of the study of FoMO and parents-children communication as factors that affect the problematic use of mobile phone in young people. Centers' guidance teams, families and teachers have to create a common learning space to promote the responsible use of mobile phone.

RESUMEN

Este estudio analiza el uso problemático del móvil, el fenómeno de «Fear of Missing Out» (FoMO: temor de perderse experiencias o fobia a sentirse excluidos) y la comunicación entre padres e hijos/as en el alumnado que cursa educación secundaria en centros públicos y concertados de las Comunidades Autónomas de Canarias, Baleares y Valencia. En la investigación participaron 569 alumnos y alumnas con edades comprendidas entre 12 y 19 años. Los instrumentos utilizados fueron el Cuestionario de Experiencias Relacionadas con el Móvil (CERM), la adaptación española del Cuestionario «Fear of Missing Out» (FoMO-E) y la dimensión de comunicación con padres y madres del «Inventario de apego con padres y pares». Los resultados muestran que: 1) A mayor uso problemático del móvil mayor nivel de FoMO; 2) El alumnado que usa con frecuencia el móvil y se comunica más con sus amigos tiene una puntuación media más alta en el «Cuestionario de Experiencias Relacionadas con el Móvil» y en el «Cuestionario FoMO-E»; 3) El alumnado que usa menos horas el móvil tiene una mayor comunicación parento-filial. En el artículo se discute la relevancia del estudio del FoMO y de la comunicación parento-filial como factores que inciden en el uso problemático del móvil en los jóvenes. Las familias, el profesorado y los equipos de orientación en los centros han de crear un espacio de aprendizaje común para fomentar el uso responsable del móvil.

KEYWORDS | PALABRAS CLAVE

Adolescence, mobile phone, critical consumption, family communication, psychological well-being, parental behavior, FoMO, risk factors.

Adolescencia, móvil, consumo crítico, comunicación familiar, bienestar psicológico, control parental, FoMO, factores de riesgo.

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1. Introduction

Information and communication technologies (ICT) are creating new communication environments (Malo-Cerrato, 2006, Arab & Díaz, 2015). In Spain, the use of ICT among children between 10 to 15 years of age is widespread (92.4%) (INE, 2017). The young people of the «Generation Z,» the first generation born in the 21st century, are characterized by incorporating ICT during their learning/socialization period (Urosa, 2015) and are integrating them at an early age in their daily life (García & Monferrer, 2009).

The use of technology has grown notably in Spanish households: 81.9% had access to the Internet in 2016; this percentage rose to 83.4% in 2017 (National Institute of Statistics (2016, 2017).) The main type of Internet connection is via the mobile phone. 97.4% of households have at least one. The use of technological devices and the place they occupy in the home generates new forms of relationship between the members of the family (Torrecillas-Lacave, Vázquez-Barrio, & Monteagudo-Barandalla, 2017).

The aim of our work is to analyze the problematic use of the mobile phone, the Fear of Missing Out (FoMO) and the parent-child communication in students between 12 and 19 years old. It specifically aims to: a) determine whether there are statistically significant relationships between these variables; b) determine whether there are significant differences in these variables according to sex, age, the frequency of use of the mobile phone, and the type of people whom students communicate most with using the mobile phone.

1.1. Problematic use of the mobile phone

The use of the mobile phone has instrumental and symbolic functions for young people. The mobile phone is a multipurpose tool for communication, expression, leisure, and information (Chóliz, Villanueva, & Chóliz, 2009); it also has a symbolic dimension formed of appearance, prestige, and autonomy. The mobile phone facilitates the possibility of appropriately managing social relations and groups the user belongs to (such as family, peer, or political groups) in real time (García & Monferrer, 2009). On its own, the mobile phone is not harmful, and its proper use can have beneficial effects: it favors children's development, offers wide possibilities of access to information and enhances learning; it also provides the possibility of parental supervision (Bartau-Rojas, Airbe-Barandiaran, & Oregui-González, 2018). An emerging indicator of the problematic use of the mobile phone is when it is consulted excessively; this generates feelings of insecurity, irritation, evasion, isolation (Beranuy, Oberst, Carbonell, & Chamarro, 2009), states of anxiety and depression, and obsessive-compulsive tendencies (Przybylski, Murayama, DeHaan, & Gladwell, 2013; Roberts, Pullig, & Manolis, 2015). It can also cause problems at school and juvenile delinquency (Lei & Wu, 2007). In short, its misuse has psychophysiological, affective and relational consequences, and it deteriorates personal relationships and communication with the immediate environment (Seo, Park, Kim, & Park, 2016).

Adolescents are the most vulnerable group in the problematic use of mobile phones (Gil, del-Valle, Oberst, & Chamarro, 2015, Przybylski & al., 2013); from their earliest childhood they are exposed to ICT, and they use them without specific training (Berríos, Buxarrais, & Garcés, 2015). Regarding the differences between sexes, girls use their mobile phones more to cope with anxious moods, overcome boredom or not feel alone, and make a greater number of mobile phone consultations compared to boys (Chóliz & al., 2009). Boys use the mobile phone for commercial reasons, coordination and entertainment tasks (Beranuy & al., 2009), they have a higher degree of "fear of not feeling connected" (Dossey, 2014), and more difficulties to stop using it excessively (De- la-Villa-Moral, & Suárez, 2016).

1.2. Fear of Missing Out (FoMO)

Przybylski and others (2013) conducted the first scientific research to operationalize the FoMO concept, and they designed the first self-report instrument to measure the phenomenon; these authors define the construct as "the generalized perception that others may be experiencing rewarding experiences of which one is absent" (Przybylski, & al., 2013: 1841). FoMO can happen with or without a mobile phone, but it has been associated with the use of mobile phones given the possibilities they provide for an unlimited connection.

FoMO is explained from the theory of self-determination (Ryan, & Deci, 2000); according to this theory it is understood as a self-regulating limbo derived from situational or chronic deficits in the satisfaction of psychological needs such as the need to act effectively in the world, have personal initiative and have relationships with others (Riordan, Flett, Hunter, Scarf, & Conner, 2015). People with unmet psychological needs have a high level of FoMO. This can increase in adolescents since they face significant challenges and obstacles to form their identity and gain their autonomy.

Various investigations link FoMO with the use of the mobile phone. In the study by Alt (2015), a relationship was found between FoMO, the problematic use of social networks on the mobile phone and academic motivation. Adolescents with the greatest need to be popular on social networks experience FoMO more than those who do not have that need (Beyens, Frison, & Eggermont, 2016); FoMO encourages people to connect to social networks and increases the fear in adolescents of not feeling connected or of missing out on experiences in their social environment (Elhai, Levine, Dvrorak, & Hall, 2016).

Oberst, Wegmann, Stodt, Brand, and Chamarro (2017) reported that people with anxiety experience FoMO and improperly use social networks on the mobile phone. This happens because young people expect the use of social networks to increase their positive emotions and eliminate or attenuate their negative emotions. However, the relief of such emotions is momentary, and the feeling of discomfort increases in the long term.

Our research shows an increase in the problematic use of mobile phones among secondary school students. The higher the use of the mobile phone, the greater the degree of FoMO; the adolescents' fear of missing out on their experiences reinforces their desire to use their mobile phones more frequently to feel connected and satisfy unmet psychological needs, which in turn impels them to use mobile phones in a problematic way. In adolescence, parent-child communication is still important. The mobile phone can be a tool to maintain communication and attachment. The regulated use of the mobile phone denotes appropriate parent-children communication.

1.3. Communication between parents and children

The family is the first social group where children interact. Through communication, the family knows and negotiates the spaces of daily life, conveys the beliefs, customs and lifestyles of each household (Rodrigo & Palacios, 2014). Family communication is a determining factor in developing attachment between children and their parents or caregivers. Attachment is defined by Armsden and Greenberg (1987) as a meaningful and lasting affective bond with a father, mother or a close peer; it is characterized by good communication, emotional closeness, and trust. Attachment is negatively related to depression and aggression (Lei & Wu, 2007). The development and strength of attachments begin in childhood and depend on physical proximity. As children grow up, physical proximity is less important, and attachment can be sustained through communication tools such as the mobile phone (instant messaging, social networks) (Lepp, Li, & Barkley, 2016). Communication is an essential element in the development of attachment in adolescence.

The incursion of ICT in society generates new dynamics in family communication in a positive and negative way. Carvalho, Francisco, and Relvas (2015) point out how ICT can change family dynamics in a positive way. For example, the possibility of communication in real time and at low cost, despite the geographical distance of the members of the family unit (Subject, verb). Quality communication between adolescents and their parents correlates negatively with the degree of Internet addictions (Liu, Fang, Deng, & Zhang, 2012). According to Davis (2001), ICT can have adverse effects on communication as they affect the quality of family relationships; this negative impact can be defined explicitly in the verbal and non-verbal disconnection that can produce misunderstandings and distancing. Therefore, it is necessary to study the positive and negative impact of ICT on family communication.

2. Method

2.1. Participants

A total of 569 students from three secondary schools in Mallorca (N = 425), Valencia (N = 70) and Tenerife (N = 74) participated in the research. These centers decided to participate in the study for two reasons: a) their

interest in raising awareness among their students about the problems generated by the inappropriate use of mobile phones, and b) their desire to promote responsible use of the mobile phone. The centers in Mallorca and Valencia are privately owned but receive state funding, and the one in Tenerife was a state school. The distribution according to sex was 61.1% female and 38.8% male. The age range was from 12 to 19 years of age (Mean=14.6, SD =1.87); 49% were between the ages of 12 and 14, and 51% between 15 and 19 years old. The distribution according to school year was: 33% were in 1st and 2nd year of Compulsory Secondary Education (CSE), 28% 3rd and 4th year of CSE and 38% in 1st and 2nd year of Upper Secondary Education.

2.2. Instruments

A questionnaire was used in the study that collected information about personal characteristics, the problematic use of the mobile phone, FoMO and parent-child communication. The problematic use of mobile phones was analyzed by means of the Mobile Related Experiences Questionnaire (MREQ) designed by Beranuy, Chamarro, Graner, and Carbonell (2009). This questionnaire was developed from the Internet Related Experiences Questionnaire (Gracia, Vigo, Fernández, & Marcó, 2002). The MREQ has 10 items with 4 response alternatives, which range from 1 (almost never) to 4 (almost always). The items are grouped into two factors: the "conflicts" factor has five items, while the other five are grouped into the "communicational and emotional use" factor. Beranuy, Chamarro, Graner, and Carbonell (2009) point out that the internal consistency of the first and second factors, applying the Cronbach α coefficient, was 0.81 and 0.79, respectively. The internal consistency index of the MREQ was 0.80.

FoMO was analyzed using the Spanish adaptation of the Fear of Missing out questionnaire (FoMO-S) of Przybylski & al. (2013) prepared by Gil & al. (2015). This instrument examines the fears and concerns that the individual may experience when they are out of touch with the experiences of their social environment. The FoMO-S has 10 items with five response alternatives, ranging from 1 (nothing) to 5 (a lot). Gil & al. (2015) point out that the internal consistency index of FoMO-S, applying the Cronbach coefficient, was 0.85.

Parent-child communication was analyzed with the Spanish version of the Parent and Peer Attachment Inventory (PPAI) of Gallarin and Alonso-Arbiol (2013). This instrument was designed from the scale of Armsden and Greenberg (1987), and it examines three dimensions: Trust, Communication, and Alienation concerning fathers, mothers, and peers. The study analyzed the second dimension in which the amplitude and quality of the communication that children have with their fathers (PPAI-F) and mothers (PPAI-M) are examined. PPAI-F and IPPAI-M have 9 items, with 5 response alternatives, from 1 (almost never or never) to 5 (almost always or always). Gallarin and Alonso-Arbiol (2013) point out that the internal consistency index of PPAI-F, applying the Cronbach α coefficient, was 0.88, and the internal consistency index of PPAI-M was 0.87.

2.3. Procedure

The management teams of the centers approved the development of the investigation. The students and the family were informed about the nature of the study to obtain their consent. Meetings were held with the teaching staff of the centers to explain the purpose of the study as well as to specify the dates to do the questionnaires. The three instruments were applied in the classrooms by one of the researchers during school hours.

2.4. Data analysis

The data analysis was performed with the SPSS21 statistical program and included the analysis of the descriptive statistics for each of the variables studied, reliability coefficient, Pearson correlation coefficient, analysis of variance, contrasts of means for independent groups and effect size (Cohen's d and Eta squared).

3. Results

3.1. Statistics of the analyzed variables

The MREQ, FoMO-S, PPAI-M and PPAI-F statistics are shown in Table 1. The distribution of MREQ and FoMO-S scores has positive asymmetry indexes. Based on the clusters identified by Carbonell & al. (2012) starting from the MREQ scores, our research found that 52% of students "have no problems" with the use of mobile phones, 46% have "occasional problems", and 2% have "frequent problems". The distribution of participants' scores has a negative asymmetry in both the PPAI-M and the PPAI-F. In both cases, the students have high scores in the quality of communication with their parents. A positive correlation was observed between the MREQ and FoMO-E scores

(r=0.53, p<.005); students who have a more problematic use of the mobile phone tend to have a higher degree of FoMO. Likewise, a positive correlation was observed (r= 0.55, p<.005) between the PPAI-M and PPAI-F scores; students with a higher quality of communication with their mothers tend to have a higher quality of communication with their fathers.

Table 1. Mean, standard deviation, asymmetry and Crombach's α of the MREQ, FoMO-E, PPAI-M and PPAI-F scores

Scale	Score. Min. / Max.	Mean	Standard deviation	Asymmetry	Cronbach's α
MREQ	10-40	15,4	2,9	0,40	0.75
FoMO-S	10-50	20,7	5,8	0,52	0.80
PPAI-M	9-45	33,5	7,3	-0,74	0.83
PPAI-F	9-45	30,5	7,6	-0,41	0.85

3.2. Problematic use of the mobile phone

There are significant differences between the mean scores in the MREQ according to age: the group of 15-19-year-olds has a significantly higher mean average score than the group of 12-14-year-olds. In other words, the eldest one is the more problematic is the use of the mobile phone. However, the effect size is low.

The analysis of variance showed significant differences between the mean average scores in the MREQ according to the frequency of use of the mobile phone: the group of students using the mobile phone for more than 4 hours has a significantly higher mean average score than the other two groups. In other words, the greater the number of hours on the mobile phone, the higher the problematic use of it. The effect size is moderate. Finally, the analysis of variance showed significant differences between the mean average scores in the MREQ according to the people whom the students communicate with most by mobile phone: those who communicate more with friends have a significantly higher mean average score than those who communicate more with their parents. In other words, they have more problems with the use of the mobile phone. However, the effect size is low. No significant differences were observed between the mean scores of the QMRE according to sex.

Table 2. MREQ: T-Test and Anova according to age, frequency of mobile phone use and people whom the students communicate with most

Scale	Age		Frequency of mobile phone use -hours/day-			People whom students communicate with most by mobile phone		
MREQ	12-14	15-19	0-2	2-4	>4	Friends	Fam.	Friends Fam.
	14.9	15.8	13.1	15.7	17.2	15,7	14,1	14,1
	T(567)=-3.6*		F(2.557)=66.2*			F (2. 566)=13.91*		
	Cohen's d=0.3		Eta-squared=0.1			Eta-squared=0.06		

*p<.05

3.3. Fear of missing out

The analysis of variance revealed significant differences between the mean average scores in the FoMO-E as a function of the frequency of use of the mobile phone: the students who use the mobile phone for more than four hours have a significantly higher mean average score than the rest of the students. In other words, they are more afraid of not feeling connected. The effect size is high.

The analysis of variance showed significant differences between the mean average scores in the FoMO-E according to the people whom the students communicate with most by means of the mobile phone: the group of those who communicate more with the friends has a mean average score significantly higher than the group that communicates more with parents.

This means that students who communicate more with friends are more afraid of not feeling connected to them. The effect size is moderate. No significant differences were observed between the mean FoMO-E scores according to sex and age.

Table 3. FoMO-S: T-Test and Anova according to frequency of mobile phone use and people whom the students communicate with most

Scale	Frequency of mobile phone use (hours/day)			People whom the students communicate most with on the mobile phone		
FoMO-E	0-2	2-4	>4	Friends	Fam.	Friends Fam.
	18.5	21	22.5	21	19.3	19.7
	F(2.557)=13.95*			F(2,566)=3,59*		
	Eta-squared=0,48			Eta-squared=0.14		

*p<.05

3.4. Mothers-children communication

There are significant differences between the mean average PPAI-M scores according to gender: female students have a higher score in the quality of communication with the mother, compared to male students. However, the effect size is low.

Table 4. PPAI-M: T-Test and Anova according to sex, age, and frequency of mobile phone use

Scale	Sex		Age		Frequency of mobile phone use (hours/day)		
PPAI-M	F	M	12-14	15-19	0-2	2-4	>4
	34.5	31.9	34.3	32.7	34.6	33.8	30.3
	T(567)=4.1*		T(567)=2.6*		F(2,557)=9.8*		
	Cohen's d=0.3		Cohen's d=0.2		Eta-squared=0.03		

*p<.05

The contrast of means showed significant differences in PPAI-M according to age: the group of 12-14-year-olds has a significantly higher mean score than the group of 15-19-year-olds. The older they are, the lower the quality of communication with the mother; however, the effect size low.

The analysis of variance showed significant differences between the mean average PPAI-M scores according to the frequency of mobile phone use: the group of students who use the mobile phone for 0 to 2 hours has a significantly higher mean average score than those in the groups that use it for more time. In other words, the lower the use of the mobile phone the more communication there is with the mother. However, the effect size is low. No significant differences were observed between the mean average scores of the PPAI-M according to the people whom the students communicate with more on the mobile phone.

3.5. Fathers-children communication

The contrast of means for independent groups showed significant differences between the mean average PPAI-F scores according to age: the group of 12-14-year-olds has a significantly higher mean average score than the group of 15-19-year-olds. The older you are, the lower the quality of communication with the father is; however, the effect size is low.

The analysis of variance showed significant differences between the average scores of the PPAIF. According to the frequency of the mobile phone use: the group of students who use the mobile phone for 0 to 2 hours has a significantly higher mean average score than the groups that use it for more time; in other words, the lower the use of the mobile phone the more communication there is with the father. However, the effect size is low. No significant differences were observed between the mean average PPAI-F scores according to the sex and the people whom the students communicated with most by mobile phone.

Table 5. PPAI-F: T-Test and Anova according to age and frequency of mobile phone use

Scale	Age		Frequency of mobile phone use (hours/day)		
PPAI-F	12-14	15-19	0-2	2-4	>4
	31.8	29.3	32.4	30.5	25.3
	T(567)=3.9*		F(2.557)=10*		
	Cohen's d=0.3		Eta-squared=0.03		

*p<.05

4. Discussion and conclusions

The aim of our research was to analyze the problematic use of the mobile phone, FoMO, and communication between parents and children in Secondary Education students.

a) Regarding the problematic use of the mobile phone, 46% of students had "occasional problems" and 2% "frequent problems". The results found do not agree with those of the study by Carbonell et al. (2012), where only 16% of adolescents expressed "occasional problems" and 2% "frequent problems". Our results also show that the use of the mobile phone is increasing in the age range of 15-19 years of age. This coincides with the results of other studies (de-la-Villa & al., 2016; Cruces, Guil, Sánchez, & Pereira, 2016): the problems with the mobile phone use increase during adolescence compared to its use in preadolescence, and they decrease in young adults. In the adolescence stage, the mobile phone becomes an instrumental and symbolic tool that allows young people to interact with peers, look for autonomy, obtain recognition and externalize their identity (Chóliz & al., 2009). Our research shows that when students use their mobile phone for more than two hours a day, there is a greater chance that

there will be a problematic use of it, compared to those who use it for less than two hours. In addition, those who communicated more with their friends tended to use the mobile phone problematically. These results are in line with those obtained by Cruz and others (2016), who reported that the problematic use of mobile phones increases when the number of hours of use per week increases.

b) Regarding the Fear of Missing Out, we observed that the degree of FoMO among students is greater as the frequency of the mobile phone use increases. At the same time, the students with FoMO tend to connect more frequently to the mobile phone because they feel more fear of not being connected, and of missing out on the experiences that this medium offers them; thus, a vicious circle is generated from which it is not easy to escape (Beyens & al., 2016; Elhai & al., 2016). As for the relationship between FoMO and the preference to communicate via mobile phone with friends or family, it was found that students with a higher degree of FoMO tend to communicate more with friends. This could be explained by the stage of the life cycle they are going through: in adolescence, connection with and recognition of peers is sought (Rodrigo & Palacios, 2014); it is a stage in which one feels the need to belong to the group and the desire to be socially connected (Gil & al., 2015). FoMO can lead to an increase in the frequency of peer-to-peer communication, which can lead to more problematic use of the mobile phone.

c) With respect to the communication between parents and children, the results showed significant differences between sexes: girls communicated more with their mothers than boys. These results are consistent with the research of Alvarado-de-Rattia (2013) in preadolescents and Spanish adolescents. According to Sánchez-Queija and Oliva (2003), the type of affective bond established in childhood with parents is related to sex. A bond of secure attachment is more frequent in women. It is characterized by a high degree of affection and communication, both with the father and with the mother. On the other hand, the link between the type of cold control and low level of affection with the mother is more frequent among boys. The students who say that they have a better quality of communication with their mother and father spend less time on their mobile phones. As regards to age differences, it was found that 12-14-year-old students communicated more with their parents. There is a transition from childhood to adolescence in this period, which is why the reference figures of their parents are very important (Lei & Wu, 2007); even minors are aware of the importance of their parents as regulators of Internet content. However, this influence decreases as children grow up in favor of their friends and colleagues (Sánchez-Valle, de-Frutos-Torres, & Vázquez-Barrio, 2017).

Malo-Cerrato, Martín-Perpiña, and Viñas-Poch (2018) point out the contagious effect that families can exercise in the use of new technologies; adolescents who use ICT excessively perceive that their mothers and siblings also use them intensively, which shows the family influence regarding the use of ICT. Older students acquire more skills in the use of interactive media, which generates less dependence on parents; in turn, parents feel less able to regulate the use of such means in their sons and daughters (Bartau-Rojas, Aierbe-Barandiaran, & Oregui-González, 2018).

d) As for the relationship between the problematic use of the mobile phone and the fear of missing out on experiences, a positive and significant relationship was observed between both variables. This result coincides with those reported in the study by Fuster, Chamarro, and Oberst (2017) and Gil & al. (2015). The fear of not feeling connected is caused by the dissatisfaction of psychological needs (Riordan, Flett, Hunter, Scarf, & Conner, 2015), and is a mediating factor in the use of the mobile phone (Carbonell et al., 2012). In the study by Oberst et al. (2017), it was observed, using a structural equation model, that FoMO is the mediating factor between depression, anxiety and the increase in the problematic use of the mobile phone.

e) A positive and significant relationship was also observed in the level of communication between fathers and children and the level of communication between mothers and children. Although students prefer to communicate more with their friends, communication with their parents is still important as it is an essential part of attachment in family dynamics (Armsden, & Greenberg, 1987). In line with what was reported by Lepp, Li, and Barkley (2016) as children grow up, physical proximity is less important for attachment bonds; communication tools such as the mobile phone can help maintain these attachment bonds.

In conclusion, our research shows an increase in the problematic use of mobile phones among secondary school students. The higher the use of the mobile phone, the greater the degree of FoMO; the adolescents' fear of missing out on their experiences reinforces their desire to use their mobile phones more frequently to feel connected and satisfy unmet psychological needs, which in turn impels them to use mobile phones in a problematic way. In adolescence, parent-child communication is still important. The mobile phone can be a tool to maintain communication and attachment. The regulated use of the mobile phone denotes appropriate parent-children communication. Technological devices such as the mobile phone should be studied as instruments that enhance family relationships.

The training of young people in the proper use of new technologies must be the work of parents, teachers, and counselors. We must count on them to create a common learning space about the problems generated by the misuse of mobile phones and the need to use them responsibly. The Educational and Psycho-pedagogical Guidance Teams in the preschool and primary education stage and the Guidance Departments in the secondary education stage must include specific work units in their Tutorial Action Plans that train the students in the appropriate use of technological artifacts (Santana, 2013; 2015). These units must be connected to the different subjects in the curriculum in order to work on such a relevant topic from an interdisciplinary and experiential approach.

One of the limitations of the study is the small number of participants in the sample. It is necessary to conduct new studies with a larger number of participants from different regions in Spain to confirm the results of the research. In addition, as this is a correlation study, its results are limited to establishing a relationship between variables, though not a causality between them. In future research, it would be necessary to analyze the causes of the problematic use of the mobile phone. In our work, we hypothesize that this problematic use may be mediated by the FoMO syndrome and by the anxiety it causes, as well as by the quality of parent-child communication. It would also be interesting to know whether the type of attachment developed by the children towards their parents and peers is related to the way they use mobile phones since new prevention and intervention guidelines could be given in this field. Likewise, it would be necessary to perform new studies with in-depth interviews that allow us to delve into the worldview of these groups, especially concerning the contents seen on the mobile phone and the social moments/contexts when they are used.

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References

Alt, D. (2015). College students' academic motivation, media engagement and fear of missing out. *Computers in Human Behavior, 49*, 111-119. https://doi.org/10.1016/j.chb.2015.02.057

Alvarado-de-Rattia, E. (2013). *Percepción de exposición a violencia familiar en adolescentes de población general: Consecuencias para la salud, bajo un enfoque de resiliencia* (Memoria de tesis doctoral inédita). Madrid: Universidad Complutense de Madrid, Departamento de Psicología.

Arab, L.E., & Díaz, G.A. (2015). Impacto de las redes sociales e Internet en la adolescencia: Aspectos positivos y negativos. *Revista Médica Clínica Las Condes, 26*(1), 7-13. https://doi.org/10.1016/j.rmclc.2014.12.001

Armsden, G.C., & Greenberg, M.T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence, 16*(5), 427-454. https://doi.org/10.1007/BF02202939

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

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. https://bit.ly/2PTQJHU

Beranuy, M., Oberst, U., Carbonell, X., & Chamarro, A. (2009). Problematic Internet and mobile phone use and clinical symptoms in college students: The role of emotional intelligence. *Computer in Human Behavior, 25*, 1182-1187. https://doi.org/10.1016/j.chb.2009.03.001

Berríos, L., Buxarrais, M.R., & Garcés, M.S. (2015). Uso de las TIC y mediación parental percibida por niños de Chile. [ICT Use and Parental Mediation Perceived by Chilean Children]. *Comunicar, 45*, 161-168. https://doi.org/10.3916/C45-2015-17

Beyens, I., Frison, E., & Eggermont, S. (2016). 'I don't want to miss a thing': Adolescents' fear of missing out and its relationship to adolescents' social needs, Facebook use, and Facebook related stress. *Computers in Human Behavior, 64*, 1-8. https://doi.org/10.1016/j.chb.2016.05.083

Carbonell, X., Chamarro, A., Griffiths, M., Oberst, U., Cladellas, R., & Talarn, A. (2012). Problematic Internet and cell phone use in Spanish teenagers and young students. *Anales de Psicología, 28*(3), 789-796. https://doi.org/10.6018/analesps.28.3.156061

Carvalho, J., Francisco, R., & Relvas, A.P. (2015). Family functioning and information and communication technologies: How do they relate? A literature review. *Computers in Human Behavior, 45*, 99-108. https://doi.org/10.1016/j.chb.2014.11.037

Chóliz, M., Villanueva, V., & Chóliz, M. C. (2009). Ellos, ellas y su móvil: Uso, abuso (¿y dependencia?) del teléfono móvil en la adolescencia. *Revista Española de Drogodependencias, 34*(1), 74-88. https://bit.ly/2BZsfct

Cruces-Montes, S.J., Guil-Bozal, R., Sánchez-Torres, N., & Pereira-Núñez, J.A. (2016). Consumo de nuevas tecnologías y factores de personalidad en estudiantes universitarios. Revista de Comunicación y Ciudadanía Digital, 5(2), 203-228. https://doi.org/10.25267/COMMONS.2016.v5.i2.09

Davis, R.A. (2001). A cognitive-behavioral model of pathological Internet use. *Computers in Human Behavior, 17*(2), 187-195. https://doi.org/10.1016/S0747-5632(00)00041-8

De-la-Villa-Moral, M., & Suárez, C. (2016). Factores de riesgo en el uso problemático de Internet y del teléfono móvil en adolescentes españoles. *Revista Iberoamericana de Psicología y Salud, 7*(2), 69-78. https://doi.org/10.1016/j.rips.2016.03.001

Dossey, L. (2014). FOMO, Digital dementia, and our dangerous experiment. *Explore: The Journal of Science and Healing, 10*(2), 69-73. https://doi.org/10.1016/j.explore.2013.12.008

Elhai, J.D., Levine, J.C., Dvorak, R.D., & Hall, B.J. (2016). Fear of missing out, need for touch, anxiety and depression arerelated to problematic smartphone use. *Computer in Human Behavior, 63*, 509-516. https://doi.org/10.1016/j.chb.2016.05.079
Fuster, H., Chamarro, A., & Oberst, U. (2017). Fear of missing Out, online social networking and mobile phone addiction: A latent profile approach. *Aloma*, *35*(1), 23-30. https://bit.ly/2LupEKJ
Gallarin, M., & Alonso-Arbiol, I. (2013). Dimensionality of the inventory of parent and peer attachment: evaluation with the spanish version. *The Spanish Journal of Psychology, 16*(E55), 1-14. https://doi.org/10.1017/sjp.2013.47
García, M.C., & Monferrer, J.M. (2009). Propuesta de análisis teórico sobre el uso del teléfono móvil en adolescentes. [A theoretical analysis proposal on mobile phone use by adolescents]. *Comunicar, 33*(XVII), 83-92. https://doi.org/10.3916/c33-2009-02-008
Gil, F., Del-Valle, G., Oberst, U., & Chamarro, A. (2015). Nuevas tecnologías. ¿Nuevas patologías? El smartphone y el fear of missing out. *Aloma*, *33*(2), 77-83. https://bit.ly/2Bxhpck
Gracia-Blanco, M., Vigo-Anglada, M., Fernández-Peréz, J., & Marcó-Arbonès, M. (2002). Problemas conductuales relacionados con el uso de Internet: Un estudio exploratorio. *Anales de Psicología*, *18*(2), 273-292. https://bit.ly/2Gy6vbV
Instituto Nacional de Estadística (Ed.) (2016). *Encuesta sobre equipamiento y uso de tecnologías de información y comunicacón en los hogares, 2016*. https://bit.ly/2EkoWih
Instituto Nacional de Estadística (Ed.) (2017). *Encuesta sobre equipamiento y uso de tecnologías de información y comunicación en los hogares, 2017*. https://bit.ly/2EHPCtF
Lei, L., & Wu, Y. (2007). Adolescents' paternal attachment and Internet use. *CyberPsychology & Behavior, 10*(5), 633-639. https://doi.org/10.1089/cpb.2007.9976
Lepp, A., Li, J., & Barkley, J.E. (2016). College students' cell phone use and attachment to parents and peers. *Computers in Human Behavior, 64*, 401-408. https://doi.org/10.1016/j.chb.2016.07.021
Liu, Q.X., Fang, X.Y., Deng, L.Y., & Zhang, J.T. (2012). Parent-adolescent communication, parental Internet use and Internet-specific norms and pathological Internet use among Chinese adolescents. *Computers in Human Behavior, 28*(4), 1269-1275. https://doi.org/10.1016/j.chb.2012.02.010
Malo-Cerrato, S. (2006). The impact of mobile phones in the life of adolescents aged 12-16 years old. [Impacto del teléfono móvil en la vida de los adolescentes entre 12 y 16 años]. *Comunicar, 27*, 105-112. https://bit.ly/2HOXTsD
Malo-Cerrato, S., 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
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
Przybylski, A.K., Murayama, K., DeHaan, C.R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computer in Human Behavior, 29*(4), 1841-1848. https://doi.org/10.1016/j.chb.2013.02.014
Riordan, B.C., Flett, J.A. M., Hunter, J.A., Scarf, D., & Conner, T. (2015). Fear of missing out (FoMO): The relationship between FoMO, alcohol use, and alcohol-related consequences in college students. *Annals of Neuroscience and Psychology, 2*(7), 1-7. https://doi.org/10.7243/2055-3447-2-9
Roberts, J.A., Pullig, C., & Manolis, C. (2015). I need my smartphone: a hierarchical model of personality and cell-phone addiction. *Personality and Individual Differences, 79*, 13-19. https://doi.org/10.1016/j.paid.2015.01.049
Rodrigo, M.J., & Palacios, J. (coords.). (2014). *Familia y desarrollo humano*. Madrid: Alianza.
Ryan, R.M., & Deci, E.L. (2000). Self-Determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist 55*(1), 68-78. https://doi.org/10.1037/0003-066x.55.1.68
Sánchez-Queija, I., & Oliva, A. (2003). Vínculos de apego con los padres y relaciones con los iguales durante la adolescencia. *Revista de Psicología Social*, *18*(1), 71-86. https://doi.org/10.1174/02134740360521796
Sánchez-Valle, 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, 53*, 103-111. https://doi.org/10.3916/C53-2017-10
Santana, L.E. (2013). *Orientación profesional*. Madrid: Síntesis.
Santana, L.E. (2015). *Orientación educativa e intervención psicopedagógica*. Madrid: Pirámide.
Seo, D.G., Park, Y., Kim, M.K., & Park, J. (2016). Mobile phone dependency and its impacts on adolescents' social and academic behaviours. *Computers in Human Behaviors, 63*, 282-292. https://doi.org/10.1016/j.chb.2016.05.026
Torrecillas-Lacave, T., Vazquez-Barrio, T., & Monteagudo-Barandalla, L. (2017). Percepción de los padres sobre el empoderamiento digital de las familias en hogares hiperconectados. *El Profesional de la Información*, *26*(1), 97-104. https://doi.org/10.3145/epi.2017.ene.10
Urosa, R. (2015). Jóvenes y generación 2020. *Revista de Estudios de Juventud*, *108*, 5-219. https://bit.ly/2BAef7q

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Constructing Donald Trump: Mobile apps in the political discourse about the President of the United States

Creando a Donald Trump: Las apps en el discurso político sobre el presidente de Estados Unidos

Dr. Salvador Gómez-García is Professor of Journalism at the University of Valladolid (Spain) (salvadorgomez@hmca.uva.es) (https://orcid.org/0000-0001-5126-6464)

Dr. Alicia Gil-Torres is Associate Professor of Journalism at the University of Valladolid (Spain) (alicia.gil@uva.es) (https://orcid.org/0000-0002-8042-2208)

José-Agustín Carrillo-Vera is Researcher in training in the Department of Information and Documentation at the University of Murcia (Spain) (joseagustin.carrillo@um.es) (https://orcid.org/0000-0002-8173-7623)

Dr. Nuria Navarro-Sierra is Associate Professor in the Department of Communication and Sociology at the University Rey Juan Carlos (Spain) (nuria.navarro.sierra@urjc.es) (https://orcid.org/0000-0002-1431-1534)

ABSTRACT

This paper explores the creation and content of apps about Donald Trump (n=412) published in Google Play between June 2015 and January 2018. The relevance of the study stems from both its objectives and its methodology. On the one hand, the aim was to characterise the profile, motivations and purposes of the developers of Donald Trump apps; and on the other, to identify the main features of the discourses in the most downloaded apps. The study relied on two resources: a qualitative questionnaire of open questions for developers (n=376), and a quantitative analysis of the content of apps that exceeded 5,000 downloads (n=117). The questionnaire identified the influence of political current affairs in the developers' ideological and economic motivations, while the content analysis revealed the trends found over time, as well as the themes, discourses and ideological positioning of the most popular apps about Donald Trump. The findings provide an empirical basis for how the content of these apps was articulated with the news; the influence of content that went viral; hegemonic discourses; and the role played by developers of new expressive, commercial, informative and persuasive proposals in the intersection between mobile apps and political campaigns.

RESUMEN

Esta investigación explora la creación y el mensaje de las apps sobre Donald Trump publicadas en la plataforma Google Play desde junio de 2015 hasta enero de 2018 (n=412). El interés del estudio proviene tanto de sus objetivos como de su metodología. Por un lado, se pretende detectar el perfil, motivaciones y propósitos de los desarrolladores de apps sobre la figura de Donald Trump y, por otro, identificar los principales rasgos de los discursos de las apps más descargadas. La investigación se ha desarrollado en dos frentes: un cuestionario cualitativo de preguntas abiertas a desarrolladores (n=376) y un análisis cuantitativo de contenido del mensaje de las apps que superaron las 5.000 descargas (n=117). El cuestionario ha identificado la influencia de la actualidad política en los desarrolladores y sus motivaciones de corte ideológico y económico mientras que el análisis de contenido ha revelado la tendencia y evolución de los temas, discursos y el posicionamiento ideológico de las apps más populares sobre Donald Trump. Los resultados establecen una base empírica en relación a la articulación del mensaje de las apps con la actualidad informativa, la influencia de los contenidos virales, los discursos hegemónicos y el rol de los desarrolladores de nuevas propuestas expresivas, comerciales, informativas y persuasivas en la conjunción de los ecosistemas de aplicaciones móviles y las campañas políticas.

KEYWORDS | PALABRAS CLAVE

Political communication, Donald Trump, quantitative analysis, infotainment, mobile apps, mobile devices, entertainment industries, Google Play.

Comunicación política, Donald Trump, análisis cuantitativo, infoentretenimiento, aplicaciones móviles, dispositivos móviles, industrias del entretenimiento, Google Play.

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1. Introduction

Mobile devices have a significant impact on all areas of everyday life and are now new mass media channels capable of meeting multiple needs (Ahonen, 2008). The services provided through these devices are based on applications (apps), which increase the original functions of mobile devices and are accessible on distribution platforms. The most well-known platforms are the App Store (for iOS-based devices) and Google Play (for Android devices), both of which have grown significantly in recent years. Google Play, for example, has gone from offering 30,000 apps in March 2010 to providing more than 3,500,000 apps in December 2017 (Statista, 2017).

This expansion comes from the interest of developers and the business opportunities that have arisen in this emerging and steadily growing sector (Gunwoong & Raghu, 2014). The scope of the academic discussion on this topic has been as wide as the phenomenon itself (Katz, 2008). It has been recognised as an independent field of research with distinctive characteristics (Taipale & Fortunati, 2014), and new methodological approaches have been developed (Boase & Humphreys, 2018). Research into apps is at a nascent stage (Light, Burgess, & Duguay, 2016), and has focused on areas such as health (Carroll, Moorhead, Bond, LeBlanc, Petrella, & Fiscella, 2017), education (Crescenzi-Lanna & Grane-Oro, 2016), and communication (Westlund, 2015, Silva & López, 2017). These uses were cemented into political practice through Obama's use of apps in the 2008 and 2012 electoral campaigns (Shankland, 2008, Tau, 2012). A reading that has been complemented by the role of apps in activism (Yamamoto, Kushin, & Dalisay, 2013), electoral participation (Martin, 2014) and political satire (Gómez-García & Cabeza, 2016). The 2016 US presidential election saw the culmination of this process as the popularity of the different candidates was reflected in their presence in app distribution platforms (McCabe & Nelson, 2016). This confirmed the new importance of apps and their contents in a broader context that recognised the transformative capacity of digital social media (De-Aguilera & Casero-Ripollés, 2018).

In light of the above, this study explores the construction of Trump as a figure in the ecosystem of mobile device applications. Two research questions were articulated within the context of online "infotainment" (Berrocal, Redondo, & Campos, 2013):

- RQ1. What are the profiles, motivations, and purposes of creators of Donald Trump apps?
- RQ2. What type of message is conveyed in the most downloaded Donald Trump apps, and what are the main features of their discourse?

The objective of the study is therefore twofold. Firstly, it provides an approach to one of the less visible aspects of the Trump phenomenon which has not yet received scholarly attention, due to its novelty and uniqueness. Secondly, it addresses the current methodological challenge involved in research focused on apps and app developers (Light, Burgess, & Duguay, 2016), and proposes some elements to build an analytical model.

2. Material and methods

2.1. Strategy and sample collection

The Google Play search engine and Sensor Tower, an app monitoring tool, were used to identify and select the sample. The App Store platform was not included due to its opacity. It does not provide some pieces of data which were essential for this study, such as the number of times a particular app has been downloaded.

The keyword "Donald Trump" was used for the search, which was completed by linked terms suggested by the platform. The sample included 412 apps published from June 2015, when Donald Trump announced his intention to run as a candidate in the Republican Party primary, until January 2018, when he had been president for one year. Based on this list, a database was created that contained all the information provided by the platform on each of the apps. The analysis contained in the study was limited by the reliability of the data provided by the platform. The results were first classified according to the number of downloads (based on the range of downloads available in the platform).

As shown in Table 1 (see the next page), the apps about Trump were estimated to have exceeded 37 million downloads by the end of May 2018. The distribution of apps according to their number of downloads was uneven, as 99.2% of the estimated downloads were concentrated in a quarter of the sample (n=117).

2.2 Procedures

The twofold focus of this study, app creators and app messages, involved the use of different methods. A qualitative questionnaire was developed based on the app's database to determine the profile of the developers, whereas a coding sheet for quantitative content analysis was employed to analyse the message.

The information available on Google Play and a questionnaire administered to all the app developers that made up the sample (n=376) were used in order to build the profile and identify the purposes of content creators. The questionnaire used open-ended exploratory questions since it sought information about a specific area, but the interviewees' possible responses were not known beforehand. Three fundamental aspects were addressed: development characteristics (people linked to the project, infrastructure and production times), motivations, and purposes (reasons for choosing this media channel and topic). Responses to the questionnaire were received from 74 of the 376 developers. The exploratory analysis of response rates was based on previous theoretical frameworks on the creation of political content for the internet (Neys & Jansz, 2010):

Table 1. Distribution of apps based on the number of downloads

Download range	Number of apps	Sum of apps	% of the sample (sum %)	Estimated downloads	% downloads (cumulative %)
1,000,001-5,000,000	8	8	2% (2%)	24,000,000	62.60% (62.60%)
500,001-1,000,000	8	16	2% (4%)	6,000,000	15.65% (78.25%)
100,001-500,000	19	35	5% (8%)	5,700,000	14.87% (93.11%)
50,001-100,000	12	47	3% (11%)	900,000	2.35% (95.46%)
10,001-50,000	41	88	10% (21%)	1,230,000	3.21% (98.67%)
5,001-10,000	29	117	7% (28%)	217,500	0.57% (99.24%)
1,001-5,000	82	199	20% (48%)	246,000	0.64% (99.88%)
501-1,000	28	277	7% (55%)	21,000	0.05% (99.93%)
101-500	68	295	17% (72%)	20,400	0.05% (99.98%)
0-100	117	412	28% (100%)	5,850	0.02% (100.00%)

- Recording purpose. The developer wanted to provide an information service about Trump and his activities.
- Expressive purpose. The developer stressed that the medium was unique as an expressive vehicle.
- Persuasion purpose. The developer sought to express an opinion, participate in a public debate, or generate a climate of opinion around Trump.
- Engagement purpose. The developer intended to promote a specific action in the political or social context.
- Commercial purpose. The developer's strategy was using topical issues that go viral to obtain financial gains, visibility, self-promotion or app promotion.
- Entertainment purpose. The developers intended to provide entertainment to the users of their applications.
- Self-realisation purpose. The developers did not consider the connotations conveyed by the content and created the app for educational or hedonistic purposes.

The quantitative analysis of the apps and the definition of the discursive variables were both framed within the idea of the computational turn (Berry, 2012), which advocates the need for the social sciences and the humanities to build specific theoretical tools to identify the discursive features of apps. The analysis was only applied to the most popular apps (n=117), which were those that exceeded 5,000 downloads as of 31 May 2018.

Figure 1. Proposed analysis of the apps' discourse

Two associated researchers did the coding using a coding sheet for quantitative content analysis recorded in a codebook. The inter-coder reliability was measured using Cohen's Kappa coefficient for each of the variables to increase the integrity of the process (Riffe, Lacy, & Fico, 2005). The following variables were collected:

a) Thematic approaches (K=0.91). These approaches were developed by using the references and prior sample analysis. The resulting classification included: popularity, physical appearance, private life, entrepreneur, presidential candidate, president of the United States, and political initiatives (both national and international).

b) Discourse type (K=0.86). Four categories were used (Haigh & Heresco, 2010): escapist (discourse that is not linked to reality, which provides an unreal or a merely viral construction); informative (discourse that offers information about Trump's activities, such as his presidential campaign); meaningful (discourse intended to give an opinion); and dramatic-satirical (discourse that highlights emotional elements with an ironic purpose). The initial results suggested the need to include a fifth category: circumstantial (a discourse that used the popularity of Trump as a character, but without proposing a complementary construction).

c) Discourse focus (K=0.79). An analysis was made to see if the characters (Trump, Hillary, etc.), topics (United States immigration, health and so on) and events linked to current affairs (presidential elections, and the construction of a wall on the border with Mexico, among others) played a leading role.

d) Ideological positioning (K=0.94). The aim was to identify whether Trump (as an individual) and/or Trump's actions were portrayed in a positive, negative or neutral way.

3. Results

3.1. Profile, motivations and purposes of app developers

3.1.1. Profile of the developers

The developers (n=376) were classified according to the total number of apps they had published on Google Play Store (Wang, Liu, Guo, Xiangqun, Miao, Guoai, & Jason, 2017), and were related to the number of downloads for the apps in the sample (Table 1).

Table 2 relates the activity of the developers to the popularity of the Trump apps they had published. This relationship was not clear from the available data. The relationship between both variables showed that "developers who created more apps are likely to have more accumulated installs" (Wang & al., 2017: 167). However, this statement should not be taken to include commercial apps when their content or theme has ideological or political premises. The data obtained in this study show that the distribution of downloads for the apps was even across the different types of profiles, with a tendency for active developers to obtain a greater number of downloads.

Another aspect of interest was that the number of apps and developers in terms of creating content was not constant, since only 31 of the developers published more than one Trump app. This divergence between the creators' app publishing activities, and their Trump apps shows that the latter were circumstantial, heterogeneous and discontinuous, rather than being part of an ideological mobilisation strategy.

The questionnaires reflected that for the majority of the apps created by sporadic or moderately active developers, creators had teams of 1 or 2 people, while the developers that qualified as active or prolific involved teams of more than 5 members. Specialist development tools were largely used. An analysis of the most popular apps (n=117) using code comparison tools (Wang, Guo, Ma, & Chen, 2015), detection of third-party libraries (Ma, Wang, Guo, & Chen, 2016) and a formal content analysis identified similarities (interface, game mechanics, aesthetic elements, etc.) among 84 of the 117 apps (71.7%). These coincidences revealed a relatively simple rationale for the creation of contents, based on virality and popular genres, with slight aesthetic variations to secure the maximum number of downloads as quickly as possible. The development times of the apps also showed disparate

Table 2. Relationship between the number of downloads and the type of developer

Download range	Prolific (> 29)	Active (10-29)	Moderate (3-9)	Sporadic (1-2)
1,000,001-5,000,000	1	2	1	4
500,001-1,000,000	1	6	0	1
100,001-500,000	1	4	10	4
50,001-100,000	2	3	4	3
10,001-50,000	2	12	17	10
5,001-10,000	3	8	12	6
1,001-5,000	6	21	24	31
501-1,000	0	6	8	14
101-500	6	9	21	32
0-100	12	12	29	64
Totals	34	83	126	169

values that were proportionally distributed between 1-6 days, between 1-3 weeks and between 1-3 months. The two extreme values were found for Trump Dab Simulator 2K17 (GadenDetErMig), which the developer claimed to have created in 30 minutes, and Border Clash (Catta Games), which took its single developer 13 months to complete.

3.1.2. Purposes involved in creating an app

The questionnaires revealed that developers had three reasons for creating apps. Firstly, a pragmatic one, insofar as this line of work involved a lower investment in terms of production and distribution compared to other options. Secondly, they had an expressive purpose, as the apps was perceived as being unique means of conveying a different opinion or discourse compared to other options, mainly due to their narrative peculiarities, or the platform or distribution channel they used. And thirdly, there was an interest in using these apps as self-promotion tools. As noted by Box10, "in addition to offering a funny interpretation, we wanted to prove that we could successfully develop high-quality applications" (Box10, Whack the Trump).

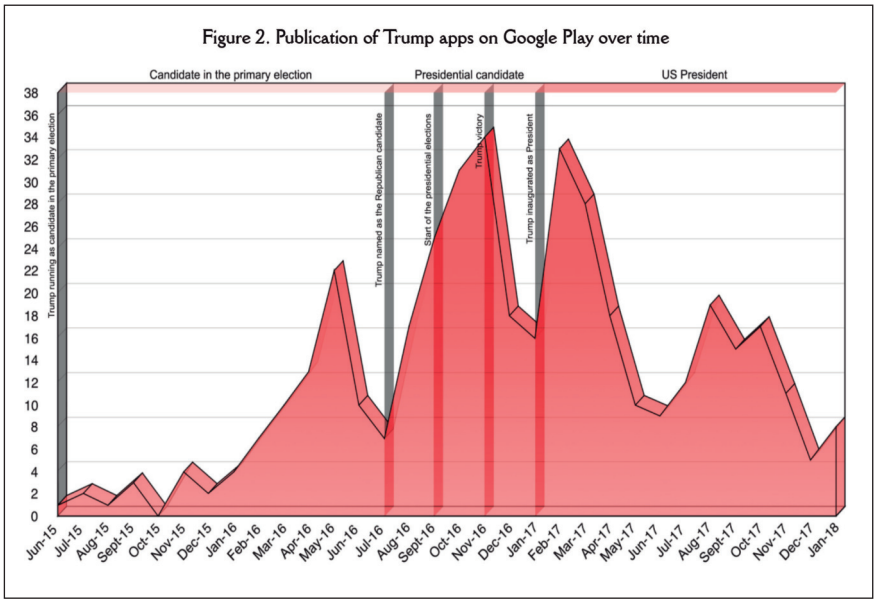


Figure 2. Publication of Trump apps on Google Play over time

The developers largely chose to develop games (286 apps, 69%) and entertainment apps (72,17%), as opposed to other categories that were in the minority (54,13%). This trend was accentuated even further when considering the estimated downloads by gender. The apps that did not correspond to the two main categories (games, 70% of the total downloads; and entertainment, 25% of the total downloads) accounted for only 5% of the total downloads of the sample. This data set provides information to establish the optimal way for the developers to achieve their objectives.

3.1.3. Why Trump?

The constant presence of Trump in the media was key for the developers who used his popularity as a source of inspiration: "we took advantage of internet trends and memes to create content" (The Meme Buttons, Real Trump Button).

Figure 2 shows the influence between political current affairs and the publication of apps. It also indicates that the campaign of the 2016 presidential elections (when Trump was already the official Republican party candidate), and the first months of Trump's presidency (from August 2016 to March 2017) were the time periods in which almost half of the sample was concentrated (202 apps, 49%).

3.1.4. The developers' purposes

The developers' reasons for creating an application about Trump were focused on various areas. The most frequent was merely entertainment, as "the application didn't have any deeper meaning, aside from the fact that it is a simple runner with a celebrity" (Josh Barton, Trump Countdown), or the interest in spreading a message inspired by "a concern about the idea of building the wall" (Ignacio Rabadán, Chili for Trump). In this vein, some developers said: "the main reason was to lampoon Trump and make fun of one of his outrageous statements (Mexico wall)" (Esayitch, Taco Trump Down). This communication potential was important both inside and outside the United

States: "everybody is talking about Trump, and American politics is influencing everybody around the world. So as I can't vote in America, I can at least make fun of what they are doing" (Rudie Productions, Trump Escape).

Despite this general trend, other developers stated that their Trump app was for information purposes but also had several additional aims. The official campaign applications and the Political Action Committees (America First and Great America) offered news about Trump, and provided information about geo-localised campaign events, organised door-to-door information activities, and donations. The same purpose was sought by another set of apps, although with a more critical intention. These allowed users "to have a record of the things Trump said that was easy to search" (Marshall Gordon, Trump Tweets Archive); as one of the developers said "his tweets about immigration inspired me to make a game to satirically 'make fun' of him" (Catta Games, Border Clash).

The aim to provide information was usually combined with a persuasive or engaging purpose. The official applications obviously went beyond a purely informative purpose, since they reinforced a positive view of Trump with a further engaging motive. However, apps that provided a negative construction of the candidate worked at different levels. The expressive capacity of the apps was combined with a sense of frustration, as stated by Rudie Productions: "I felt frustrated with the current politics all over the world and wanted to contribute something to the critique" (Rudie Productions, Trump Escape); or, as in the case of Marshall Gordon, "it was made to call out Trump on lies and hypocrisy" (Marshall Gordon, Trump Tweets Archive). The purpose of apps such as Boycott Trump was to create a climate featuring "a unified grassroots movement centred on holding companies and individuals that help Trump in any way accountable" (Democratic Coalition Against Trump).

The commercial or viral purpose also mobilised a large number of developers. As claimed by one of them, "the figure of Trump attracts a lot of people, and that means consumers" (Yunus Kulyyev, Trump'em!). Along these lines, another developer argued: "I used Donald Trump as a character because I felt that it would encourage more people to play the game as he was, and still is, a controversial figure" (Josh Barton, Trump Countdown). This trend was seen in the apps that were available in the database which exceeded 5,000 downloads (n=117). A line of distribution of the content can be identified through free apps (100%) that relied on advertising (87.3%) or purchases within the apps (34.9%) to obtain their revenues.

3.2. Message analysis

3.2.1. Thematic approaches

The popularity of the character (n=65) and his running as a presidential candidate (n=25) were the most popular reasons when compared with the rest, which were in the minority: political initiatives (n=14), president of the United States (n=5), entrepreneur (n=4), physical appearance (n=4) and private life (n=0). The majority of approaches subscribed to the logic of viral promotion that had been pointed out by the developers and was behind their specific uses. The more common option involved using the image of Trump without altering the essence of the original content. Existing resources and codes were used to simplify this work in similar apps such as soundboards (10), spoof calls (6) or mainly, versions of popular games (73), including Angry Birds, Super Mario Bros or Mahjong, among others.

The combination of the most recurrent approaches, popularity, and choices, explain the main peaks in the production of apps shown in Figure 2. The average number of apps published monthly in the stage when Trump announced he would run as a presidential candidate was 21.1, and it declined as the circumstances that made him popular (the novelty of his presence in the political sphere and the presidential campaign) were no longer current. Thus, the monthly average of Trump apps after his inauguration as president decreased to 14.2 apps.

3.2.2. Discourse focus

The analysis of the discourse focus was based on three aspects: characters, themes, and events. The central character of the search, Donald Trump, was obviously the leading figure in the apps in the sample. Political campaigns can currently be personalised (Garzia, 2017), which explains the high average number of apps published in the periods when the primary and the presidential elections took place. The political figure that appeared most frequently (after Trump) was his main political rival, Hillary Clinton (14). Other Democratic politicians were also featured in the apps, albeit more symbolically (Barack Obama, Bernie Sanders), as well as some non-US political figures (Vladimir Putin, Kim Jong-Un). Trump's personal circle was not much in evidence, and none of the apps analysed mentioned other Republican politicians. The hegemonic status of Trump in his own party was reflected in the app Trump on Top (IDC Games), which involved a fight between two sides: Republican and Democratic

politicians. One side was made up of characters who were Democratic politicians, including Hillary Clinton, Barack Obama, and Joe Manchin. The other side was composed of different characters that all referred to Trump (Entrepreneur, Trumpoline, SuperTrump). This reflected the perception of the heterogeneous Democratic leadership as opposed to the homogeneous leadership on the Republican side.

The analysis of specific issues and events revealed the ambiguous nature of this type of content. There were hardly any direct references to particular events, except for two important ones: the presidential election in the United States (n=24), and the proposal to build a wall on the border with Mexico (n=10). The discourse on the US presidential election adopted a confrontation perspective, while in the discourse related to the wall, most apps provided satirical or critical views about the building process of the wall, its demolition, and attempts to cross it. These constructions lacked complexity, but their repeated use indicated their significance within the overall themes being addressed.

> The proliferation of mobile apps about Trump points to new trends in content creation via digital distribution platforms. This paper highlights the developers' purposes in creating the Trump apps; their firm commitment to apps as an optimal vehicle for creative expression in the digital ecosystem; the current accessibility of app development; and how media contexts can be valuable in terms of choosing important figures or topics to showcase them as an app's main focus.

3.2.3. Types of discourses

The narratives contained in the Donald Trump apps mainly focused on a circumstantial discourse (37.6%), followed by those that used dramatic-satirical (28.2%), escapist (18.8%), and meaningful (13.7%) discourses, and almost anecdotally, some of the discourses were provided for information purposes (1.7%). There were a series of apps (56.4%) circumstantial and escapist in their approach that sought to make their creators visible within the platform by using viral self-promotion techniques. Another group (41.9%) adopted an editorial strategy (dramatic-satirical and meaningful) to create a negative construction of the character, exploring the discursive capacities of this channel. It should also be noted that the apps were rarely used for information purposes about social and political actors. In contrast, it was particularly interesting to see how the discourses evolved over time in the three major segments identified by the study, as shown in Figure 3 (next page).

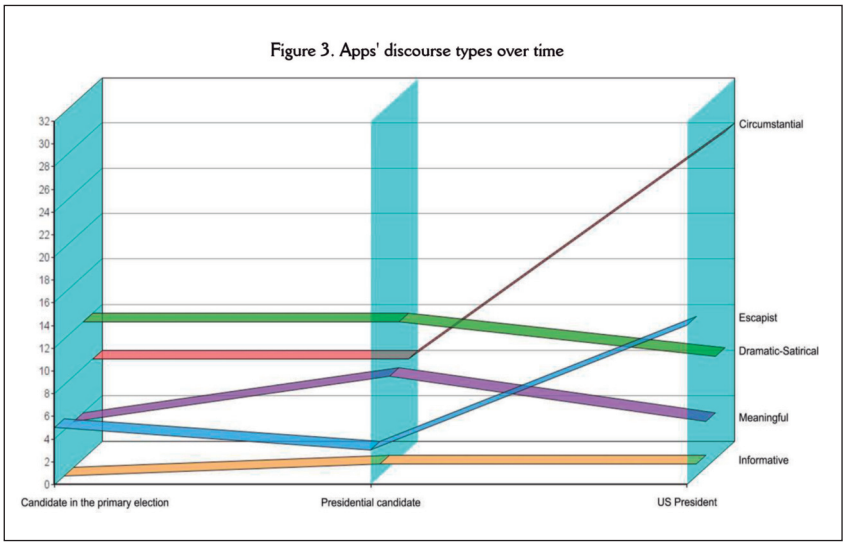
Two trends were identified in the publication of apps over the different periods. The first was the growth in the number of apps linked to viral strategies and an aseptic (circumstantial and escapist) construction of Donald Trump. The second trend reflected the reverse process, as largely editorial apps (dramatic-satirical and meaningful) were found. It was observed that the discourses pivoted around support or political confrontation in the campaign periods (primary and presidential elections), and later shifted to a more commercial view, banking on Trump's popularity as US president and focused on content monetisation and self-promotion.

3.2.4. Ideological positioning

The apps that portrayed a neutral representation of Donald Trump were in the majority (68.3%), compared to those that advocated a negative (28.2%) or a positive (3.4%) view. This distribution points to a correlation between circumstantial and escapist discourses together with a positioning that exposed their interest in using Trump for commercial or satirical ends, rather than for ideological purposes. This pattern is shown in Figure 4 over the period of the sample (see next page).

4. Discussion and conclusions

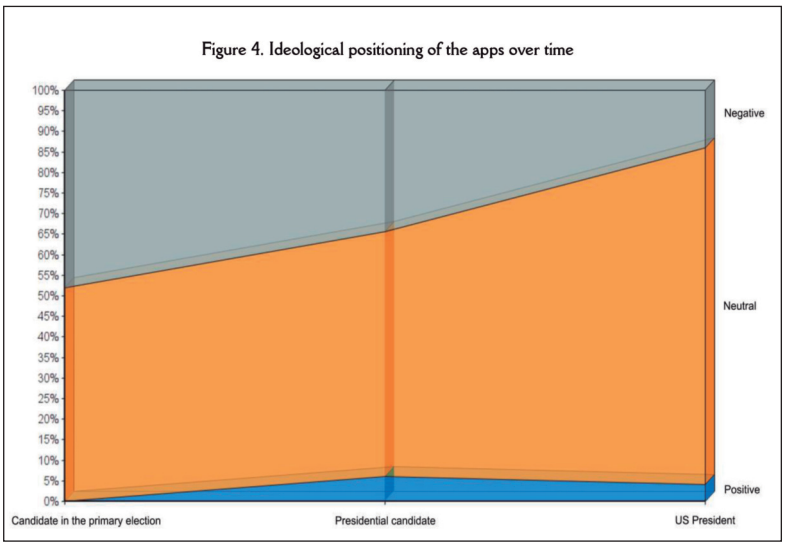
The controversial popularity of Donald Trump in the American political sphere, and its manifestations in other countries, have spawned efforts to define a new political context, in an attempt to recognise the elements that



contributed to his victory in the US presidential elections of 2016 (Rodríguez-Andrés, 2018; Azari, 2017). This phenomenon is intertwined with a new plane of the media ecosystem, namely mobile applications, where links are made that are currently studied in academic research (Aguado, Martínez, & Cañete-Sanz, 2015). This paper provides an interpretation of this intersection through two research questions related to the messages produced and the creators of those messages. The creators of app content in the sample have heterogeneous profiles, although some common trends were identified. There were four major types of developers, according to their level of production. This may have involved creating apps of higher or lower formal quality, but was unrelated to their success after being published on Google Play. The largest number of apps came from sporadic and moderately productive developers (71.6%).

The purposes of these developers in creating the apps were either economic or ideological. For the majority of them, the revenues from creation and distribution, or directly produced by the app as it went viral, were part of the logic of "earned media". This is the same economic logic that led US television channels to provide comprehensive coverage on Donald Trump without any editorial control (McIntyre, 2018: 109). In the same vein, this was the rationale used by one of the main architects of "fake news" about Donald Trump, Beqa Latsabidze, who stated that he had no political motive; he was just following the money (McIntyre, 2018: 121). However, very few developers reported on whether they had obtained the expected results from these apps, although the creators of one of the most popular ones –Dump Trump (Daydream)– identified its viral nature as a key element to its success.

In contrast, the least popular motivation, ideological positioning, was found to occur unevenly. Interestingly, the neutral apps that parodied Trump had more downloads than the apps that were markedly critical. In these cases, the developers favoured applications that created content (images, videos, memes, etc.) to be shared on social networks in order to go beyond the borders of the app ecosystem.



The developers' intentions were reflected, both consciously and unconsciously, in the apps' discourse. One of the main characteristics was that the apps simplified discourses, both by the use of caricature (aesthetics) and satire (message). It was therefore confirmed that the most popular set of apps (n=117) proposed archetypes and clichés through graphic humour. In this process,

two issues of interest were identified. The first was that the apps with a more critical discourse were in the minority (both in number and the quantity of downloads) compared to those that opted for greater simplification and virality. This trend can be explained by using the Elaboration Likelihood Model of Persuasion (Petty & Cacioppo, 1986). This was also seen in the case of games on social networks (Schulze, Schöler, & Skiera, 2014), because when users searched for apps merely for their enjoyment, they did not seek something more profound, or which could be used outside the scope of entertainment. The second question of interest was that the apps proliferated in parallel to the latest news. Since creation processes have become more automated and simplified, developers were able to obtain some kind of benefit (financial gain, prestige or self-realisation). This was directly linked to three converging vectors: the influence of current affairs on the users' behaviour when consuming news on a mobile device (Westlund, 2015); the "prosumer" and "produser" logics attached to the digital environment (Bruns, 2012); and the controversial practice of cloning in mobile apps (Crussel, Gibler, & Chen, 2012).

The increasingly neutral content of the apps (shown in Figure 4) meant that it was not permeated by the news to the same extent that both the developers and apps themselves were. By cross-referencing the data presented in Figures 2 and 3, it could be seen that the apps dealt with the most topical issues. It has been confirmed that the current affairs of a given period were diluted in the sample; the message contained in the apps, therefore, was a simple construction based on stereotypes, rather than being based on issues related to the political agenda. The failure to include specific issues was only overcome (according to the data from the most popular apps) during the presidential election and when a proposal was made by Trump to build a wall on the US-Mexico border, a phenomenon that articulated cross-border public opinion (Meneses, Martín-del-Campo & Rueda-Zarate, 2018). These factors indicated that there was no specific political discourse (other than a few isolated initiatives), and that the majority of the apps took advantage of political current affairs to gain virality and influence. Therefore, the ideological positioning in app discourse resulted from a direct critique on the part of the less productive developers, which became weakened and leaned towards cathartic and timeless positions (Figure 4). All in all, they moved away from the trends mostly found in the social networks, which privileged basic, visceral and uncivil discourses (Ott, 2017). In view of the above, two future lines of research can be outlined: firstly, conducting a detailed analysis of the discourse in politically-focused apps and, secondly, investigating the penetration and modes of reception of the political contents disseminated through mobile apps.

In short, Trump's popularity in the mobile app ecosystem derived from the combination of a series of apparently unrelated factors: the developers' motive of self-promotion; their interest in experimenting with new expressive formulas; the social, political and media importance of the political figure involved; and the simplified creation process and the current use of app content. However, while this set of features shapes the dynamics of the political content created in app distribution platforms, these ultimately adhere to the rationale that "there is no business like show business".

Funding Agency

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References

Aguado, J.M., Martinez, I.J., & CañeteSanz, L. (2015). Tendencias evolutivas del contenido digital en las aplicaciones móviles. *El Profesional de la Información*, *24*(6), 787795. https://doi.org/10.3145/epi.2015.nov.10

Ahonen, T. (2008). *Mobile as 7th of the mass media: Cellphone, cameraphone, Iphone, smartphone*. London: Futuretext.

Azari, J.R. (2016). How the news media helped to nominate Trump. *Political Communication*, *33*, 677-680. https://doi.org/10.1080/10584609.2016.1224417

Berrocal, S., Redondo, M., & Campos, E. (2013). Una aproximación al estudio del infoentretenimiento en Internet: Origen, desarrollo y perspectivas futuras. *AdComunica*, *4*, 63-79. https://doi.org/10.6035/2174-0992.2012.4.5

Berry, D.M. (2012). Introduction: Understanding the digital humanities. In Berry D.M. (Eds.), *Understanding digital humanities* (pp.1-20). London: Palgrave Macmillan. https://doi.org/10.1057/9780230371934_1

Boase, J., & Humphreys, L. (2018). Mobile methods: Explorations, innovations, and reflections. *Mobile Media & Communication*, *6*(2), 153-162. https://doi.org/10.1177/2050157918764215

Bruns, A. (2012). Reconciling community and commerce? Collaboration between produsage communities and commercial operators. *Information, Communication & Society*, *15*(6), 815-835. https://doi.org/10.1080/1369118X.2012.680482

Carroll, J.K., Moorhead, A., Bond, R., LeBlanc, W.G., Petrella, R.J., & Fiscella, K. (2017). Who uses mobile phone health apps and does

use matter? A Secondary data analytics approach. *Journal of Medical Internet Research*, *19*(4), e125. https://doi.org/10.2196/jmir.5604
Crescenzi-Lanna, L., & Grane-Oro, M. (2016). An analysis of the interaction design of the best educational apps for children aged zero to eight. [Análisis del diseño interactivo de las mejores apps educativas para niños de cero a ocho años]. *Comunicar, 46*, 77-85. https://doi.org/10.3916/C46-2016-08
Crussell, J., Gibler, C., & Chen, H. (2012). Attack of the clones: Detecting cloned applications on android markets. *European Symposium on Research in Computer Security*, 37-54. https://doi.org/10.1007/978-3-642-33167-1_3
De-Aguilera, M., & Casero-Ripollés, A. (2018). ¿Tecnologías para la transformación? Los medios sociales ante el cambio político y social. Presentación. *Icono 14*, *16*(1), 1-21. https://doi.org/10.7195/ri14.v16i1.1162
Garzia, D. (2017). Personalization of politics between television and the Internet: Leader effects in the 2013 Italian parliamentary election. *Journal of Information Technology & Politics 14*(4), 403-416. https://doi.org/10.1080/19331681.2017.1365265
Gomez-Garcia, S., & Cabeza, J. (2016). El discurso informativo de los newsgames: el caso Bárcenas en los juegos para dispositivos móviles. *Cuadernos.Info*, *38*, 137-148. https://doi.org/10.7764/cdi.38.593
Gunwoong, L. & Raghu, T.S., (2014). Determinants of mobile apps' success: Evidence from the app store market. *Journal of Management Information Systems*, *31*(2), 133-170. https://doi.org/10.2753/MIS0742-1222310206
Haigh, M., & Heresco, A. (2010). Late-night Iraq: Monologue joke content and tone from 2003 to 2007. *Mass Communication & Society 13*(2), 157-173. https://doi.org/10.1080/15205430903014884
Katz, J.E. (2008). *Handbook of mobile communications studies.* Cambridge, MA: The MIT Press. https://doi.org/10.7551/mitpress/9780262113120.001.0001
Light, B., Burgess, J., & Duguay, S. (2016). The walkthrough method: An approach to the study of apps. *New Media & Society*, *20*(3), 881-900. https://doi.org/10.1177/1461444816675438
Ma, Z., Wang, H., Guo, Y., & Chen, X. (2016). Libradar: Fast and accurate detection of third-party libraries in Android apps. In *Proceedings of the 38th International Conference on Software Engineering Companion (ICSE '16)*, 653-656. https://doi.org/10.1145/2889160.2889178
Martin, J.A. (2014). Mobile media and political participation: Defining and developing an emerging field. *Mobile Media & Communication*, *2*(2), 173-195. https://doi.org/10.1177/2050157914520847
Meneses, M.E., Martín-del-Campo, A., & Rueda-Zárate, H. (2018). #TrumpenMexico. Transnational connective action on Twitter and the border wall dispute. [#TrumpenMéxico. Acción conectiva transnacional en Twitter y la disputa por el muro fronterizo]. *Comunicar, 26*(55). https://doi.org/10.3916/C55-2018-04
McCabe, W., & Nelson, R. (23/03/2016). *App store data offers unique insights into the 2016 Presidential Race*. [Mensaje en un blog]. https://bit.ly/2ccpGW3
McIntyre, L. (2018). *Posverdad.* Madrid: Cátedra.
Neys, J., & Jansz, J. (2010). Political Internet games: Engaging an audience. *European Journal of Communication*, *25*(3), 227-241. https://doi.org/10.1177/0267323110373456
Ott, B.L. (2017). The age of Twitter: Donald J. Trump and the politics of debasement. *Critical Studies in Media Communication*, *34*(1), 59-68. https://doi.org/10.1080/15295036.2016.1266686
Petty, R.E., & Cacioppo, J.T. (1986). *Communication and persuasion: Central and peripheral routes to attitude change*. New York: Springer. https://doi.org/10.2307/1422805
Riffe, D., Lacy, S., & Fico, F. (2014). *Analyzing media messages. Using quantitative content analysis in research.* New York: Routledge. https://doi.org/10.4324/9780203551691
Rodriguez-Andres, R. (2018). Trump 2016: ¿Presidente gracias a las redes sociales? *Palabra Clave*, *21*(3), 831-859. https://doi.org/10.5294/pacla.2018.21.3.8
Schulze, C., Schöler, L., & Skiera, B. (2014). Not all fun and games: Viral marketing for utilitarian products. *Journal of Marketing*, *78*(1), 1-19. https://doi.org/10.1509/jm.11.0528
Shankland, S. (2008). *Obama releases iPhone recruiting, campaign tool*. [Mensaje en un blog]. https://cnet.co/2NL9IY6
Silva-Rodriguez, A., & Lopez-Garcia, X. (2017). Visión retrospectiva de la investigación sobre comunicación y periodismo móvil en España. In A. De-Lara-Gonzáles, & F. Arias-Robles. (Eds.), *Mediamorfosis: Perspectivas sobre la innovación en periodismo* (pp.106-117). Elche: Universidad Miguel Hernández. https://bit.ly/2xfBbqq
Statista (Ed.) (2017). *Number of available applications in the Google Play Store from December 2009 to June 2018*. [Portal estadístico online]. https://bit.ly/2mOe6UQ
Taipale, S. & Fortunati, L. (2014). Capturing methodological trends in mobile communication studies. *Information, Communication & Society, 17*(5), 627-642. https://doi.org/10.1080/1369118X.2013.862562
Tau, B. (2012). *Obama campaign launches mobile app*. [Mensaje en un blog]. https://politi.co/2p6bTaD
Wang, H., Guo, Y., Ma, Z., & Chen X. (2015). Wukong: A scalable and accurate two-phase approach to Android app clone detection. *Proceedings of ISSTA '15*, 71-82. https://doi.org/10.1145/2771783.2771795
Wang, H., Liu, Z., Guo, Y., Xiangqun, C., Miao, Z., Guoai, X., & Jason, H. (2017). An Explorative Study of the Mobile App Ecosystem from App Developers' Perspective. *International World Wide Web Conference Committee*, 163-172. https://doi.org/10.1145/3038912.3052712
Westlund, O. (2015). News consumption in an age of mobile media: Patterns, people, place, and participation. *Mobile Media & Communication*, *3*(2), 151-159. https://doi.org/10.1177/2050157914563369
Yamamoto, M., Kushin, M.J., & Dalisay, F. (2013). Social media and mobiles as political mobilization forces for young adults: Examining the moderating role of online political expression in political participation. *New Media & Society 17*(6), 880-898. https://doi.org/10.1177/1461444813518390

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Robotics to develop computational thinking in early Childhood Education

Robótica para desarrollar el pensamiento computacional en Educación Infantil

Dr. Ana García-Valcárcel Muñoz-Repiso is Full Professor in the Department of Didactics, Organization and Research Methods at the University of Salamanca (Spain) (anagv@usal.es) (https://orcid.org/0000-0003-0463-0192)

Yen-Air Caballero-González is Collaborating Professor in the Research Group GITCE at the Technological University of Panama and Scholarship Rechearcher of the SENACYT / IFARHU of the Republic of Panama (ycaballero@usal.es) (https://orcid.org/0000-0002-7493-6683)

ABSTRACT

The development of programming skills is currently promoting from an early school age, trying to get children to take an active and creative role in the use of technologies. The objective of this article is to verify the repercussion of educational robotics activities on kindergarten students in the acquisition of computational thinking and programming skills. The research design is quasi-experimental, with pre-test and post-test measures, using experimental and control groups. The sample consists of 131 students from the second cycle of early education (between 3 and 6 years old), all from the same Spanish school. Computational thinking is measured through three dimensions: sequences (algorithms), action-instruction correspondence and debugging. The intervention sessions, as well as the structure of the challenges that were used in the pre- and post-test evaluations, were designed based on the reference program of robotics studies called "TangibleK". The intervention, carried out doing learning activities using educational robotics resources, presents positive results in relation to the computational thinking skills achieved. The differences between the pre-test and the post-test in the experimental and control groups are statistically significant, in that children engaged in robotics program achieves a greater advance in the three dimensions of computational competence through this method.

RESUMEN

Actualmente se promueve el desarrollo de habilidades de programación desde una edad escolar temprana, tratando de que los niños adquieran un rol activo y creativo en el uso de las tecnologías. El objetivo de este trabajo es comprobar la repercusión del desarrollo de actividades de robótica educativa en la adquisición de habilidades de pensamiento computacional y programación en escolares de educación infantil. El diseño de la investigación es de tipo cuasi-experimental, con medidas pretest y postest, utilizando grupo experimental y control. La muestra la conforman 131 estudiantes del segundo ciclo de educación infantil (entre 3 y 6 años de edad) de un centro educativo español. El pensamiento computacional se mide a través de tres dimensiones: secuencias (algoritmos), correspondencia acción-instrucción y depuración. Las sesiones de intervención, así como la estructura de los retos que se utilizaron en las evaluaciones pre y postest fueron diseñadas tomando como base el programa de estudios en robótica denominado «TangibleK». La intervención, centrada en actividades de aprendizaje mediante recursos de robótica educativa, presenta resultados positivos en relación a las habilidades de pensamiento computacional logradas. Las diferencias encontradas entre el pre y postest en el grupo experimental son estadísticamente significativas y superiores a las presentadas en el grupo control, de modo que se concluye que los niños que realizan el programa de robótica consiguen un mayor avance en las tres dimensiones de la competencia computacional.

KEYWORDS | PALABRAS CLAVE

Childhood education, robotics, computational thinking, educational innovations, skills development, creative thinking, active learning, quantitative analysis.

Educación infantil, robótica, pensamiento computacional, innovación pedagógica, desarrollo de habilidades, pensamiento creativo, aprendizaje activo, análisis cuantitativo.

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1. Introduction and state of the question

The current digital situation calls for the development of strategies to modernize learning processes, including initiatives for the acquisition of digital skills to enable all citizens to function in a digitalised society. In this context, there is a growing trend promoting the development of programming skills from early school age to ensure that people acquire an active and creative role in the use of technologies, through the mastery of new cognitive skills and practices such as code-literacy.

1.1. Robotics for educational purposes

Currently, robotics is incorporated as highly valuable educational resources in the development of technical and social skills. Educational Robotics (ER) finds its main sustenance in constructivist and constructionists learning theories (Bravo & Forero, 2012; Schwabe, 2013). According to Papert, knowledge is achieved to the extent that the individual interacts with the object of study (Bers, Flannery, Kazakoff, & Sullivan, 2014); in this sense, the ER allows individuals to achieve this level of interaction. Through learning activities based on the design and construction of prototypes, students develop significant knowledge, moving from the abstract to the tangible (Pittí, Curto-Diego, & Moreno-Rodilla, 2010). Educational robotics can be integrated into the teaching-learning process through various practical approaches, one of which is its adoption as the main object of learning (Goodgame, 2018; Karampinis, 2018); a second approach would be as a means of learning (Koning, Faber, & Wierdsma, 2017; Kucuk & Sisman, 2017); the third would be to use it to support learning developments (Moro, Agatolio, & Menegatti, 2018). In the first two approaches, the orientation is aimed at the construction and programming of robots, using gear parts, sensors, actuators, and coding instructions according to the syntax of a programming language. Currently the main educational initiatives with robotics, are in these two approaches, by means of the development of training activities through courses and workshops (Buss & Gamboa, 2017; Ozcinar, Wong, & Ozturk, 2017); an example is the First Lego League, an international challenge that promotes interest in science and technology.

In the third approach, robots are used within the classroom, as a didactic resource (Bruni & Nisdeo, 2017; Serholt, 2018). In this way, learning can be facilitated by inquiry, where the occurrence of errors is taken as a learning opportunity. We find some initiatives developed in countries such as the United Kingdom, one of the pioneering nations in the development of programming skills and computational thinking from a formal curricular perspective, which has incorporated the subject "Computing" into its school curriculum.

1.2. Computational thinking

New theories on code-literacy (Zapata-Ros, 2015), which allow individuals to communicate with devices through instructions in computer languages, trigger a great interest by the computational thinking processes (Liu, Perera, & Klein, 2017). Jeanette Wing used this term for the first time in 2006, arguing that this type of thinking "involves solving problems, designing systems and understanding human behavior, based on the fundamental concepts of informatics" (Wing, 2006: 33). Subsequently, it was considered as a basic competence that every citizen would have to acquire to function in the digital society. In addition, she argued that computational thinking is neither routine nor mechanical, but a way of solving problems intelligently and imaginatively (Wing, 2008).

In 2009, the National Science Foundation funded the project "Leveraging Thought Leadership for Computational Thinking in PK-12". This was a joint program between the Association of Computer Science Teachers and the International Society for Technology in Education. The purpose of this initiative was to make computational thinking concepts accessible to educators by providing an operational definition, shared vocabulary and meaningful examples appropriate for the age of the students. The project linked educational objectives with classroom practices (Barr, Harrison, & Conery, 2011).

In Europe, we find similar projects; one is Erasmus+ KA2 "TACCLE3 – Coding. The contents presented through the project's website (http://taccle3.eu/), are an example of successful educational practices and experiences in the process of incorporation and promotion of these skills (García-Peñalvo et al., 2016). A significant contribution to the conceptual framework on computational thinking has been made by researchers Karen Brennan (Harvard University) and Mitch Resnick (MIT) formulating an alternative model on this style of thinking. The model was proposed within the research project that resulted in the creation of Scratch, a visual programming platform "by blocks" that allows children and young people to make their own interactive stories with animations and simulations in a playful environment. The model of computational thinking formulated by Brennan and Resnick (2012) is based on three dimensions: computational concepts, practices, and perspectives.

From our point of view, computational thinking could be defined as the ability and capacity to solve problems using programming and the fundamentals of computational science. In recent years, an approach which is increasingly used has been developed, aimed at improving children's technological literacy and making computational thinking a relevant competency in school environments (Caballero & García-Valcárcel, 2017; Liu, Perera, & Klein, 2017). Some research provides evidence that shows the positive changes that occur in students immersed in training courses in programming skills and computational thinking using programmable robots (Chen, Shen, Barth-Cohen, Jiang, Huang, & Eltoukhy, 2017; Durak & Saritepeci, 2018). In the Spanish context, programs are increasingly targeted at children in the early stages of education on mathematical content, such as algebra, with the use of robotic devices adapted to children for the development of computational thinking skills successfully (Alsina & Acosta, 2018).

The integration of robotics during the first school stages takes advantage of the fact that in this period new ideas are created based mainly on experiences and concepts previously learned; there is a great influence of the family environment (Seppänen, Schaupp, & Wahlström, 2018; Wong, Jiang, & Kong, 2018). Learning, therefore, occurs when children, using information captured by their senses, share ideas, test their limits and receive feedback. In these actions, imagination and creativity play an important role in the production of new knowledge (Buitrago, Casallas, Hernández, Reyes, Restrepo, & Danies 2017). In addition, the development of programming and computational thinking skills through robots capitalizes on the playful characteristics of the resource and context, which represents a positive impact, according to Froebel's approach to games (Resnick & Rosenbaum, 2013).

> The study demonstrates that it is possible to develop computational thinking skills from early school stages through robotic activities. Children who have participated in the training program have acquired new skills to design and develop programming sequences using tangible objects (robots), being able to check the consequences and accuracy of the designed instructions, as well as detect errors in the programming sequences.

2. Material and method

Considering the theoretical framework exposed and considering there are still few empirical studies that prove the impact of educational robotics on the development of computational thinking in young children, this study aims to test the influence of a training program based on learning activities with educational robotics on the acquisition of computational thinking skills in early childhood education.

At present, there are several resources of educational robotics that allow the introduction of programming at early ages. The Bee-Bot® robotics kit is used for this research. This is a bee-shaped floor robot with a structure that combines resilience and subtlety at the same time. Other factors in its favor are its dimensions, which allow for easy handling. In addition, its colors, sounds, and movements make it a suitable resource for use with young children between the ages of 3 and 7.

On the other hand, its manufacturer, the English company TTS, has a recognized trajectory in the design and construction of educational resources for which this robot represents a mature educational technology with a high level of confidence and checked quality. The robot has buttons to program the sequence of movements it must perform: advance, reverse, turn left or right, start to move, pause the movements and delete the previous commands. The robot displaces in 15 cm movements, makes 90º turns and stores up to 40 instructions in its memory. For the study, a series of rugs or mats that were designed explicitly for research according to the objectives of the training activities were used. In addition, a story was elaborated for each rug that among its characters involved the Bee-Bot® robot itself. This story was presented to the children before they were shown the challenge they had to solve. The purpose of the story was to present the challenges in a playful and motivating context adapted to the children's age.

2.1. Research design

The research questions used for this study are the following:

1) Is it possible to develop the computational thinking of children in the early childhood education stage (3-6 years) through robotic activities in the classroom?

2) Can children improve their ability to sequence actions by responding to a challenge through programming activities using educational robots?

3) Can children improve their ability to relate the instructions they give to a robot to the action it performs?

4) Can children improve their ability to identify and correct existing errors in a programming sequence?

With these questions in mind, the objective of this research focuses on assessing the students' performance when facing these computational challenges, both initially and once they have completed a training program with robotic activities, thus, assessing the effectiveness of the program in terms of the skills developed by participants.

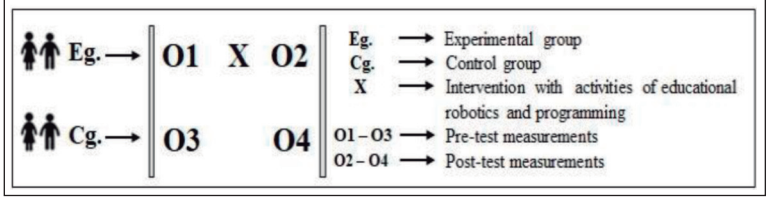
As a starting hypothesis, it was established that the integration of a program of learning activities with educational robotics would significantly contribute to the acquisition of computational thinking skills in Early Childhood Education schoolchildren.

The study was developed using a quasi-experimental design (Campbell & Stanley, 1993; Hernández & Maquilón, 2010), with pre-test and post-test measurements in two groups (experimental and control), as shown in the diagram in Figure 1. The students are divided into two groups, experimental (Eg), whose members would perform the training program, and control group (Cg), comprised of subjects who would not participate in robotics activities (Kandlhofer & Steinbauer, 2016). The allocation of students to groups could not be done randomly since the intervention allowed by the school required working with intact groups formed according to criteria inherent to the school itself and independent of the study. Following the methodological criteria of this type of research design, measures were collected from everyone (experimental and control group), before and after the intervention.

2.2. Variables

Two types of variables were defined in the research design: independent and dependent (Hernández & al., 2014: 238). The independent variable was one that was manipulated to measure its effect on the dependent variable. Thus, the educational robotics training program was the independent variable. The dependent variable was defined as the students' computational thinking and programming skills, considering three dimensions, which could be evaluated through the robotics kit:

Figure 1: Research design diagram



1) Sequences: ability to sequence actions by responding to a challenge through programming activities.

2) Action-instruction correspondence: ability to relate the instructions given to a robot with the action it performs.

3) Debugging: ability to identify and correct existing errors in a programming sequence.

Brennan y Resnick (2012) described the sequences as a series of steps that must be taken for a task to succeed.

Computational thinking action-instruction refers to the execution to be performed by the robot each instruction was provided with (Bers, Flannery, Kazakoff, & Sullivan, 2014). The practical dimension of debugging corresponds to the performance of a task by means of the trial and error method, learning from mistakes.

2.3. Participants

The sample was made up of 131 children from a subsidized center located in Salamanca, during the 2016-2017 academic year. All the participants were informed of the objectives of the study, and the informed consent of the minors' parents/guardians was compiled with the collaboration of the school. The age range of the participants was between 3 and 6 years old (70% between 4 and 5 years old). The distribution of participants in groups was 67 for the experimental group (51% of the entire sample) and 64 in the control group (49% of the entire sample), with a gender-balanced proportion observed. Girls represented 45% of the subjects in the experimental group and 48% in the control group.

2.4. Procedure

The research was structured based on three stages: the first involved the initial measurement of the dependent variable (pre-test), the second developed the training program (intervention), and the third repeated the administration of the evaluation test (post-test).

The intervention consisted of the development of 7 working sessions with the children in the experimental group. The first was an introduction to the use of the devices, and in the following 6 sessions the children explored concepts and carried out practices on programming. The intervention sessions were designed using the TangibleK robotics curriculum –created by the DevTech research group at Tufts University in Boston, directed by teacher Umaschi Bers– as a reference (Bers, 2010).

Planning for the training session was done in agreement with the teachers, whose function was to introduce the researcher to the class group in a familiar setting, to supervise the activities developed in class and to evaluate the performance of the children together with the researcher. Each session took place during a school day, with an approximate duration of four hours per day, integrating robotics activities in the curriculum to enhance logical-mathematical skills. During the course of the activities, the students worked in small groups (4-5 members) collaboratively. The sessions were organized based on the planned objectives:

• In the introductory session, called 'My first steps in robotics,' students had the opportunity to use the Bee-Bot® robot, exploring its characteristics and achieving a general understanding of the resource's functionalities.

• In sessions 1 and 2 they worked on the Sequence dimension. The children had to create sequences of instructions to have the robot move across the mat. First, simple forward movements were programmed. Left and right turns were then included.

• Sessions 3 and 4 focused on the Action-instruction correspondence dimension. Cards were used to enable the children to program the way they wanted the robot to move and then they were checked against the robots' movements.

• Sessions 5 and 6 were focused on the debugging dimension. In these sessions, children were provided with simple sequences containing errors that they had to detect and correct to successfully complete the challenge.

The third phase began once the training sessions were over. At this point, a new measurement was developed through the application of Solve-it tests (programming challenges accompanied by ludic stories) that allow for the evaluation of the participants' acquired learning in the experimental and control groups. The evaluation tests were carried out individually.

2.5. Instruments

The evaluation instrument used to assess the level of performance achieved by the children is an adaptation of the "SSS" rubric used in the TangibleK program (Bers, 2010). The researcher and the teacher applied the rubric together and agreed on the evaluation results for each student.

Each dimension was evaluated through the resolution of two challenges posed to children. Each challenge received a score of 0 to 5 points, depending on the autonomy of the subject to solve the challenge and the success achieved (performance). The criteria formulated in the rubric was valued with a maximum score of 5 if the child completely achieved the assigned challenge without any help from the researcher. If the student almost achieved the assigned challenge with minimum help from the researcher, the achievement obtained was scored with a 4. If the development of the challenge was moderately satisfactory, receiving periodic aid from the researcher, but not step-by-step, the value assigned was 3 points. When the child displayed a minimal response to the assigned challenge, obtaining step-by-step help from the researcher in the process, he or she was assigned a 2. In the case of a student initiating the development of the challenge, but not completing it, a score of 1 was assigned, and when the participant did not attempt to solve the challenge, the assigned score was 0. For this study, a value of 4 was set as the objective level of achievement to overcome each challenge satisfactorily.

2.6. Data analysis

To verify the influence of educational robotics activities on the acquisition of computational thinking skills in school children, the results obtained in the pre-test and post-test were analyzed, distinguishing the dimensions: sequences, action-instruction correspondence and debugging.

First, the normality of the sample was determined using the Kolmogorov-Smirnov normality test. The use of this type of test is recommended when the study is performed on a sample of more than 30 individuals, as it was our

case. This test is important because it enables the determination of whether to use parametric or nonparametric tests in the analyses for statistical hypothesis contrast. In the statistical analyses that were carried out, $\alpha<0.05$ was established as a critical value.

The Kolmogorov-Smirnov test data on pre-test results in the experimental and control groups leads to the conclusion that these data do not follow a normal distribution. The asymptotic significance value calculated for each dimension of computational thinking and the total is less than the confidence level established for the analyses. This leads to the use of nonparametric contrast tests such as the U of Mann-Whitney and the W of Wilcoxon.

3. Results

3.1. Study of the equivalence of the experimental and control groups in the pre-test

First, the pre-test results in the experimental (Eg) and control (Cg) groups were compared to verify their equivalence. The data obtained show that the groups were not equivalent, as significant differences can be observed between both groups when comparing the means of all dimensions and the total score (complete test), with more positive results seen in the experimental group (see Table 1). The lack of equivalence in the experimental and control groups is an issue that could not be foreseen a priori since the school formed the groups before beginning the research, and group modification were not allowed. The verification of this situation was considered when selecting the most appropriate data analysis strategy, since, although this is not a desirable situation to establish the comparison between the control and experimental groups, it is not an insurmountable barrier, as specific methods of analysis offer a solution to this (non-equivalent control group designs).

Table 1. Differences in the pre-test between experimental and control group (Mann-Whitney Test)

Variables	Mean Eg N=67	Mean Cg N=64	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (bilateral)
Dimensions						
Sequence	5.61	4.75	1046.50	3126.50	5.337	.000
Correspondence	4.15	3.03	687.50	2767.50	7.056	.000
Debugging	4.91	4.25	1329.00	3409.00	4.274	.000
Complete test						
Computational thinking	14.67	12.03	569.50	2649.50	7.319	.000

3.2. Analysis of post-test results

The data obtained in the post-test also show significant differences ($p<.001$) between the experimental group and the control group in all the variables studied (dimensions and complete test), as it can be seen in Table 2. However, since these are not initially equivalent groups, these differences are not directly attributable to the intervention; thus it is necessary to deepen the analysis.

Following the guidelines of non-equivalent control group designs (Campbell & Stanley, 1993; Tejedor, 2000) to find the incidence of the independent variable in the dependent variable, the significance of the differences produced between the pre- and post-test scores in each of the dimensions of the dependent variable was analyzed for both the experimental and control groups (see Table 3 on the next page). To this end, new variables are defined: DiferenSequence, DiferenCorrespondence, DiferenDebugging, and DiferenTotal, which are obtained by calculating the difference between the pre- and post-test scores. It can be observed that the difference between the pre-test and the post-test in the experimental group is more than 2 points in all dimensions, reaching 8.16 points in the complete test (DiferenTotal). However, in the control group, the scores in the final test increased less the differences being less than 1 point in all dimensions and 1.22 in the complete test. If we observe the statistical significance of the differences pointed out, only in one case it is not significant: the debugging dimension in the control group. In this variable, there was no increase in the abilities of children in the control group. While, for the rest of the variables, even in the control group, there were

Table 2. Differences in the post-test between experimental and control group (Mann-Whitney Test)

Variables	Mean Eg N=67	Mean Cg N=64	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (bilateral)
Dimensions						
Sequence	7.66	5.16	144.50	2224.50	9.352	.000
Correspondence	7.19	3.72	70.50	2450.50	9.713	.000
Debugging	7.88	4.37	79.50	2159.50	9.654	.000
Complete test						
Computational thinking	22.84	13.25	47.50	2127.50	9.690	.000

significant differences that can be explained as an instrumentation effect (due to the administration of the initial test or pre-test, which may have implied some learning) as well as the maturation effect (due to the maturation of the children during the months of intervention, given that at these young children learn new abilities constantly and very quickly).

Table 3. Analysis of the differences between post-test and pre-test (Wilcoxon Test)

Variables	N	Mean Dif.	Typical deviation	Z	Asymp. Sig. (bilateral)
Experimental Group (Eg)					
DiferenSequence	67	2.149	1.183	6.872	.000
DiferenCorrespondence	67	3.045	1.036	7.190	.000
DiferenDebugging	67	2.970	1.128	7.171	.000
DiferenTotal	**67**	**8.164**	**2.359**	**7.130**	**.000**
Control Group (Cg)					
DiferenSequence	64	.406	.706	4.004	.000
DiferenCorrespondence	64	.687	.732	5.516	.000
DiferenDebugging	64	.125	.882	1.117	.264
DiferenTotal	**64**	**1.219**	**1.339**	**5.467**	**.000**

Additionally, with the data generated from the differences between the post-test and the pre-test, other statistical analyses were carried out, such as the non-parametric Mann-Whitney U test for independent samples, to confirm whether the learning gains in the experimental group are significantly higher than those in the control group. Defining the gain as the increase in the post-test score concerning the pre-test, the test results reflected an asymptotic significance of less than .01 (Table 4) for each of the variables. Therefore, the results obtained in the final tests show significant differences between the two groups (experimental and control); it can be argued that the children in the experimental group obtained greater abilities than those in the control group thanks to the intervention conducted, demonstrating a greater progress (statistically significant) in post-test scores.

The size of the effect has been estimated for the complete test by calculating the Cohen's value. This is extraordinarily high (1.84), much higher than the value 0.80 established as very high. This value reaffirms the difference in the achievements made by the children according to the group to which they were assigned, being greater in the group that carried out the training.

3.3. Graphical analysis of differences between experimental and control groups

Finally, we show the existing differences in the experimental and control groups through a graphical analysis using the ROC curves (García-Valcárcel & Tejedor, 2017). We did this taking as study variables the differences between the pre-test and post-test scores in each of the dimensions for the dependent variable, and in the total variable called computational thinking skills. As a classification or state variable, the group variable is considered with two possible values: experimental group and control. For the analysis, the members of the experimental group have been considered as positive cases and have been represented in the graph.

Table 4. Analysis of the differences between experimental and control group (Mann-Whitney Test)

Variables	Mann-Whitney U	Z	Asymp. Sig. (bilateral)
Dimensions			
DiferenSequence	484.50	-7.868	.000
DiferenCorrespondence	179.00	-9.241	.000
DiferenDebugging	99.500	-9.551	.000
Complete test			
Computational thinking	16.00	-9.551	.000

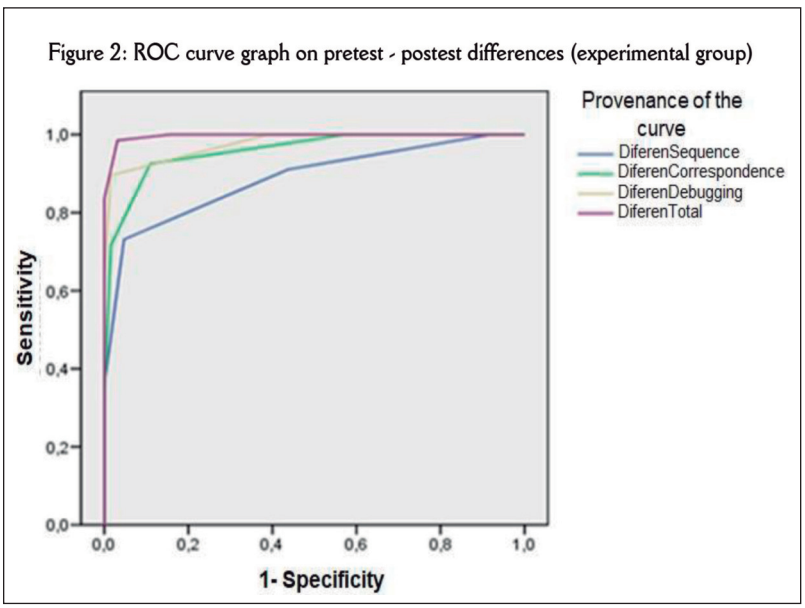
Figure 2 (see next page) shows the pairs of values (1- specificity, sensitivity) generated by the graph of ROC curves for each of the study variables (DiferenSequence, DiferenCorrespondence, DiferenDebugging, and DiferenTotal). It can be observed that all the curves are above the reference value (diagonal of the area). This is because the scores of the students in the experimental group are much higher than those of the students in the control group in all the analysis variables, as it is also shown in the preceding tables.

4. Discussion and conclusions

The development of educational robotics activities oriented to the acquisition of computational thinking skills presents positive results, corroborating that the training program facilitates the development of thinking skills in the following dimensions: sequences, action-instruction correspondence and debugging. The significant differences found between the members of the experimental and control groups demonstrate the existence of greater learning in the experimental group for each of the variables analyzed. The children in the control group also showed better skills in the post-test, which can be attributed to the maturation effect, the learning attributed to the pre-test, and to

the fact that during the period of time in which the intervention took place, progress continued in the curricular program, specifically in the area of logic and mathematics, which generated greater knowledge linked to the skills evaluated.

Children who participated in the program acquired new skills to design and develop programming sequences using tangible objects (robots). These new skills allowed them to experimentally check the consequences and accuracy of the designed instructions, as well as detect errors in the programming sequences. The methodology used also supports the acquisition of social skills, such as communication, collaborative work, creativity, autonomy, and leadership. This form of learning is related to active learning methodologies and constructionist learning theories that postulate that knowledge is achieved through the interaction of the subject with the object of study (Bers, Flannery, Kazakoff, & Sullivan, 2014).



This study shows that it is possible to develop these thinking skills from early school stages, as program participants were between 3 and 6 years of age, and these children responded to the study expectations, allowing the initial hypothesis to be tested. The research also shows the impact of incorporating robotics in the development of significant learning in digital competencies related to programming. At the same time, it lays the foundations for the implementation of more complex technological learning scenarios at higher school levels.

The results achieved coincide with the conclusions of other research projects (Lee, Sullivan, & Bers, 2013; Elkin, Sullivan, & Bers, 2014) that show the positive effects of the introduction of robotic resources to promote the development of skills and interests linked to the STEM knowledge areas (Science, Technology, Engineering and Mathematics).

We consider it pertinent to highlight some limitations of the study carried out that must have to do with the size of the sample. It could have been wider if there had been more schools interested in participating in the study, as well as the equivalence of groups that could have been achieved with a random assignment of the participants to the groups which was not possible in this study due to the school organization. In this regard, the limitations of the researchers and the conditions established by the educational centers for the development of this type of studies must be considered. We consider that the results presented can be interpreted as an approximation to the subject, although more studies are required to consolidate the conclusions.

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References

Alsina, A., & Acosta, Y. (2018). Iniciación al álgebra en Educación Infantil a través del pensamiento computacional: Una experiencia sobre patrones con robots educativos programables. *Revista Iberoamericana de Educación Matemática*, *52*, 218-235. https://bit.ly/2PC1hLt

Barr, D., Harrison, J., & Conery, L. (2011). Computational Thinking: A digital age skill for everyone. *Learning and Leading with Technology, 38*(6), 20-23.

Bers, M.U. (2010). The TangibleK Robotics program: Applied computational thinking for young children. *Early Childhood Research & Practice, 12*(2). https://bit.ly/2RZ3B11

Bers, M.U., Flannery, L., Kazakoff, E.R., & Sullivan, A. (2014). Computational thinking and tinkering: Exploration of an early childhood robotics curriculum. *Computers & Education*, *72*, 145-157. https://doi.org/10.1016/j.compedu.2013.10.020
Berrocoso, J., Sánchez, M., & Arroyo, M. (2015). El pensamiento computacional y las nuevas ecologías del aprendizaje. *Red*, *46*, 1-18. https://doi.org/10.6018/red/46/3
Bravo, F.A., & Forero, A. (2012). La robótica como un recurso para facilitar el aprendizaje y desarrollo de competencias generales. *Teoría de la Educación*, *13*(2), 120-136. https://bit.ly/2EtOVnJ
Brennan, K., & Resnick, M. (2012). New frameworks for studying and assessing the development of computational thinking. In P*roceedings of the 2012 Annual Meeting of the American Educational Research Association (AERA)* (pp. 1-25). Vancouver, Canada.
Bruni, F., & Nisdeo, M. (2017). Educational robots and children's imagery: A preliminary investigation in the first year of primary school. *Research on Education and Media*, *9*(1), 37-44. https://doi.org/10.1515/rem-2017-0007
Buitrago, F., Casallas, R., Hernández, M., Reyes, A., Restrepo, S., & Danies, G. (2017). Changing a generation's way of thinking: Teaching computational thinking through programming. *Review of Educational Research*, *87*(4), 834-860. https://doi.org/10.3102/0034654317710096
Buss, A., & Gamboa, R. (2017). Teacher transformations in developing computational thinking: Gaming and robotics use in after-school settings. In P.J. Rich & C.B. Hodges (Eds.), *Emerging research, practice, and policy on computational thinking* (pp. 189-203). Switzerland: Springer International Publishing. https://doi.org/10.1007/978-3-319-52691-1_12
Caballero, Y.A., & García-Valcárcel, A. (2017). Development of computational thinking skills and collaborative learning in initial education students through educational activities supported by ICT resources and programmable educational robots. In F.J. García-Peñalvo (Ed.), P*roceedings of the 5th International Conference on Technological Ecosystems for Enhancing Multiculturality* (p. 103). New York: ACM. https://doi.org/10.1145/3144826.3145450
Chen, G., Shen, J., Barth-Cohen, L., Jiang, S., Huang, X., & Eltoukhy, M.M. (2017). Assessing elementary students' computational thinking in everyday reasoning and robotics programming. *Computers and Education*, *109*, 162-175. https://doi.org/10.1016/j.compedu.2017.03.001
Campbell, D., & Stanley, J. (1993). *Diseños experimentales y cuasiexperimentales en la investigación social*. Buenos Aires: Amorrortu.
Durak, H.Y., & Saritepeci, M. (2018). Analysis of the relation between computational thinking skills and various variables with the structural equation model. *Computers & Education*, *116*, 191-202. https://doi.org/10.1016/j.compedu.2017.09.004
Elkin, M., Sullivan, A., & Bers, M.U. (2014). Implementing a robotics curriculum in an early childhood Montessori classroom. *Journal of Information Technology Education: Innovations in Practice*, *13*, 153-169. https://doi.org/10.28945/2094
García-Peñalvo, F.J., Rees, A.M., Hughes, J., Jormanainen, I., Toivonen, T., & Vermeersch, J. (2016). A survey of resources for introducing coding into schools. *Proceedings of the Fourth International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM'16)* (pp.19-26). Salamanca, Spain, November 2-4, 2016. New York: ACM. https://doi.org/10.1145/3012430.3012491
García-Valcárcel, A., & Tejedor, F.J. (2017). Percepción de los estudiantes sobre el valor de las TIC en sus estrategias de aprendizaje y su relación con el rendimiento. *Educación XXI*, *20*(2), 137-159. https://doi.org/10.5944/educxx1.19035
Goodgame, C. (2018). Beebots and Tiny Tots. In E. Langran, & J. Borup (Eds.). *Society for Information Technology & Teacher Education International Conference* (pp. 1179-1183). Association for the Advancement of Computing in Education (AACE).
Hernandez-Sampieri, R., Fernandez-Collado. C., & Baptista-Lucio. P. (2014). *Metodología de la investigación*. México: McGraw-Hill Education.
Kandlhofer, M., & Steinbauer, G. (2016). Evaluating the impact of educational robotics on pupils' technical-and social-skills and science related attitudes. *Robotics and Autonomous Systems*, *75*, 679685. https://doi.org/10.1016/j.robot.2015.09.007
Karampinis, T. (2018). Robotics-based learning interventions and experiences from our implementations in the RobESL framework. *International Journal of Smart Education and Urban Society*, *9*(1), 13-24. https://doi.org/10.4018/ijseus.2018010102
Koning, J.I., Faber, H.H., & Wierdsma, M.D. (2017). Introducing computational thinking to 5 and 6 years old students in dutch primary schools: An educational design research study. In C. Suero, & M. Joy (Eds.), P*roceedings of the 17th Koli Calling Conference on Computing Education Research Calling Conference on Computing Education Research* (pp. 189-190). New York: ACM. https://doi.org/10.1145/3141880.3141908
Kucuk, S., & Sisman, B. (2017). Behavioral patterns of elementary students and teachers in one-to-one robotics instruction. *Computers & Education*, *111*, 31-43. https://doi.org/10.1016/j.compedu.2017.04.002
Lee, K.T., Sullivan, A., & Bers, M.U. (2013). Collaboration by design: Using robotics to foster social interaction in kindergarten. *Computers in the Schools*, *30*(3), 271-281. https://doi.org/10.1080/07380569.2013.805676
Liu, H.P., Perera, S.M., & Klein, J.W. (2017). Using model-based learning to promote computational thinking education. In P.J. Rich, & C.B. Hodges (Eds.), *Emerging research, practice, and policy on computational thinking* (pp. 153-172). Switzerland: Springer International Publishing. https://doi.org/10.1007/978-3-319-52691-1_10
Moro, M., Agatolio, F., & Menegatti, E. (2018). The RoboESL Project: Development, evaluation and outcomes regarding the proposed robotic enhanced curricula. *International Journal of Smart Education and Urban Society*, *9*(1), 48-60. https://doi.org/10.4018/ijseus.2018010105
Ozcinar, H., Wong, G., & Ozturk, H.T. (Eds.) (2017). *Teaching computational thinking in primary education*. USA: IGI Global. https://doi.org/10.4018/978-1-5225-3200-2
Pittí, K., Curto-Diego, B., Moreno-Rodilla, V. (2010). Experiencias construccionistas con robótica educativa en el Centro Internacional de Tecnologías Avanzadas. *Education in the Knowledge Society*, *11*(1), 310-329. https://bit.ly/2MNPwls
Resnick, M., & Rosenbaum, E. (2013). Designing for tinkerability. In M. Honey & D.E. Kanter (Eds.), D*esign, make, play: Growing the next generation of STEM innovators* (pp.163-181). New York: Routledge.
Schwabe, R.H. (2013). Las tecnologías educativas bajo un paradigma construccionista: un modelo de aprendizaje en el contexto de los nativos digitales. *Revista Iberoamericana de Estudos em Educação*, *8*(3), 738-746. https://doi.org/10.5860/choice.51-1612
Seppänen, L., Schaupp, M., & Wahlström, M. (2018). Enhancing learning as theoretical thinking in robotic surgery. *Nordic Journal of*

Vocational Education and Training, 7(2), 84-103. https://doi.org/10.3384/njvet.2242-458x.177284
Serholt, S. (2018). Breakdowns in children's interactions with a robotic tutor: A longitudinal study. *Computers in Human Behavior, 81*, 250-264. https://doi.org/10.1016/j.chb.2017.12.030
Tejedor, F.J. (2000). El diseño y los diseños en la evaluación de programas. *Revista de Investigación Educativa, 18*(2), 319-339.
Wing, J.M. (2006). Computational thinking. *Communications of the ACM, 49*(3), 33-35. https://doi.org/10.1145/1118178.1118215
Wing, J.M. (2008). Computational thinking and thinking about computing. *Philosophical Transactions. Series A, Mathematical, Physical, and Engineering Sciences, 366*(1881), 3717-3725. https://doi.org/10.1098/rsta.2008.0118
Wong, G., Jiang, S., & Kong, R. (2018). *Computational thinking and multifaceted skills: A qualitative study in primary schools. in teaching computational thinking in primary education*. USA: IGI Global. https://doi.org/10.4018/978-1-5225-3200-2.ch005
Zapata-Ros, M. (2015). Pensamiento computacional: Una nueva alfabetización digital. *RED, 46*, 1-47. https://doi.org/10.6018/red/45/4

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Use of technologies and academic performance in adolescent students

Uso de tecnologías y rendimiento académico en estudiantes adolescentes

Sheila García-Martín is Doctoral Candidate in the Department of General and Specific Didactics and Educational Theory at the University of León (Spain) (sgarcm@unileon.es) (https://orcid.org/0000-0003-1298-8549)

Dr. Isabel Cantón-Mayo is Full Professor in the Department of General and Specific Didactics and Educational Theory at the University of León (Spain) (icanm@unileon.es) (https://orcid.org/0000-0002-9757-8233)

ABSTRACT

Technologies have acquired strategic importance and have been defined as unprecedented educational tools. In this study, we analysed the use that 1,488 Spanish adolescents made of five tools (i.e. search engines, wikis, blogs, podcasts and instant messaging), and the impact that use of these tools had on their academic performance in science, mathematics, Spanish language and English. To this end, we explored frequency of use, time spent, purpose, place of use and level of satisfaction for each of the tools, as well as academic performance in the four subjects analysed, using the HEGECO instrument. Results revealed differential patterns in the use of technologies according to purpose, and in academic performance according to sex, age and use of the tools. Adolescents used search engines and wikis to carry out academic tasks, and podcasts for entertainment. In relation to academic performance, females presented better mean performance in linguistic subjects, and younger adolescents did so in all the subjects analysed. In relation to use of tools, the use of search engines was associated with better performance in science, Spanish language and English, while the use of podcasts was associated with better performance in mathematics. The implications of these results are discussed and evaluated.

RESUMEN

Las tecnologías han adquirido una importancia estratégica, llegándose a definir como herramientas educativas sin precedentes. En este estudio se analiza el uso que 1.488 adolescentes españoles hacen de cinco herramientas; motores de búsqueda, wikis, blogs, podcast y mensajería instantánea, y se estudia el impacto de dicho uso en su rendimiento académico en Ciencias, Matemáticas, Lengua Castellana e Inglés. Para ello, se explora la frecuencia de uso, el tiempo dedicado, la finalidad, el lugar de uso y el grado de satisfacción con cada herramienta, así como los logros académicos obtenidos en las cuatro asignaturas analizadas, a través del instrumento HEGECO. Los resultados muestran patrones diferenciales en el uso de las tecnologías en función de la finalidad y en el rendimiento académico en función del sexo, de la edad y del uso de herramientas. Los adolescentes utilizan herramientas como motores de búsqueda y wikis para realizar tareas académicas y el podcast para divertirse. Relativo al rendimiento académico, las mujeres presentan un rendimiento promedio superior en las áreas lingüísticas, así como los adolescentes más jóvenes en todas las asignaturas analizadas. En función del uso de herramientas, el uso de motores de búsqueda se relaciona con un mayor rendimiento en Ciencias y en las áreas lingüísticas y el uso de podcast con un mayor rendimiento en Matemáticas. En este sentido, y a la luz de los resultados se discuten y se valoran las implicaciones.

KEYWORDS | PALABRAS CLAVE

ICT, academic performance, adolescents, secondary education, educational technology, digital competence, learning, educational context.

TIC, rendimiento académico, adolescentes, educación secundaria, tecnología educativa, competencia digital, aprendizaje, contexto educativo.

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1. Introduction

Learning and knowledge technologies have been defined as 'unprecedented educational tools' (Pantoja & Huertas, 2010: 225). They encompass search engines, wikis, blogs, instant messaging and podcasts or video and audio files that allow users to create, collaborate, connect, share and participate in a learning community (García-Martín & García-Sánchez, 2013; Yuen & Yuen, 2010).

Recent years have witnessed the steady incorporation of technologies in schools (Bocyl, 2015). Hence, the variables that have traditionally been related to academic performance must now be expanded to include technologies, especially those that correspond to the institutional technology environment, accessibility and internet use. These tools are viewed as new determinants of academic performance since they affect student work at different levels and in different ways (Duart, Gil, Pujol, & Castaño, 2008; Han & Shin, 2016; Torres-Díaz, Duart, Gómez-Alvarado, Marín-Gutiérrez, & Segarra-Faggioni, 2016).

Several authors have examined young people's use of technologies and the impact of some of these tools on their academic performance (Junco, 2015; Noshahr, Talebi &, Mojallal, 2014; Wentworth & Middleton, 2014). Tools such as wikis are a widely used resource among adolescents (Soler-Adillon, Pavlovic, & Freixa, 2018), as is instant messaging, which facilitates direct personal communication and thus increases trust and a sense of intimacy among young people (Cetinkaya, 2017; Noshahr, Talebi, & Mojallal, 2014).

Furthermore, seeking information on the Internet involves selecting appropriate sources and then extracting, organising and integrating the information obtained, helping students acquire problem-solving abilities. Furthermore, participation in chats improves communication and interaction skills (Jonassen & Kwon, 2001; Ndege, & al., 2015; Tabatabai & Shore, 2005).

In support of these assertions, the results of various studies show that both computer use and the type of activity engaged in contribute significantly to explain not only the academic performance in young people but also the greater academic success in higher education achieved by those who make balanced use of technologies (Gil, 2012; Torres-Díaz & al., 2016).

In contrast, other studies have found no relationship between academic performance and technology usage and access to education, reporting no significant correlation between marks and the time students spend using technologies (Noshahr, Talebi, & Mojallal, 2014). It has also been reported that the use of technologies can affect student performance in one particular area but not in others. For example, it has been found that computer use in education does not contribute significantly to improving students' performance in mathematics, but does do so in science (Antonijevic, 2007; Wittwer & Senkbeil, 2008).

Research has yielded contradictory results, underlining the need to conduct new studies that analyse students' technology usage patterns. Likewise, it is also necessary to determine use of these tools in schools and its influence on students' academic performance during adolescence, a stage characterised by psychosocial and cognitive changes that are being affected by the exponential increase in the use of technologies (Montes-Vozmediano, García-Jiménez, & Menor-Sendra, 2018; Risso, Peralbo, & Barca, 2010).

Hence, the aim of this study was to analyse adolescent students' use of five technologies and determine the impact of these on their academic performance.

1.1. Research questions

In order to determine whether the use of technology influences adolescent students' academic performance and achievement, we investigated: (i) adolescent students' use of five technology tools (search engines, wikis, blogs, podcasts and instant messaging) and (ii) the impact of the use of these tools on adolescent students' academic performance.

Our research questions were as follows:

1) What are adolescent students' patterns of use of technology tools (search engines, wikis, blogs, podcasts and instant messaging)? Our hypothesis was that most adolescents would use the tools analysed, mainly in the home and in most cases for entertainment purposes.

2) Does the use of technology tools in the classroom exert an influence on adolescent students' academic performance? We hypothesised that the more technology tools (search engines, wikis, blogs, podcasts and instant messaging) were used in the classroom, the better the students' academic performance would be in the four core subjects analysed (mathematics, science, Spanish language, and English); that female students would present better academic performance than male students; and that older adolescents would present the best performance.

2. Material and methods

2.1. Sample

We surveyed 1.488 students aged between 12 and 18 years old, of which 698 were male and 790 females, distributed evenly between four courses of compulsory secondary education (CSE: 1st year n=397, 2nd year n=403; 3rd year n=324; 4th year n=364). This was a representative sample obtained through the intentional sampling of nine Spanish educational centres attended by students from both rural and urban areas. All these educational centres are located in Castile and Leon.

2.2. Research instrument

A questionnaire was designed, the Hegeco, consisting of three differentiated parts: 1) the first part consisted of three questions about students' general personal details: age, gender and educational level; 2) the second part included thirty specific questions about use, frequency, time spent, purpose, place of use and levels of satisfaction for five technology tools (search engines, wikis, blogs, podcasts and instant messaging),and (iii) the third part consisted of thirty questions about use of these tools in the classroom and about academic performance, the most recent marks in four core subjects of compulsory secondary education (science, mathematics, Spanish language and English). Two identical versions of the questionnaire were designed, an online version (through Google Forms) and a print version to facilitate the collection of data. A principal component analysis (PCA) was run on the questionnaire. The suitability of PCA was assessed prior to analysis. The overall Kaiser-Meyer-Olkin (KMO) measure was 0.883 with individual KMO measures all greater than 0.7, classifications of 'middling' to 'meritorious' according to Kaiser (1974). Bartlett's test of sphericity was statistically significant ($p<.0005$), indicating that the data was factorizable.

> A detailed analysis of questionnaire responses revealed differential patterns in the use of technologies according to purpose. Adolescents used tools such as search engines and wikis to do homework and academic tasks, podcasts for entertainment and instant messaging to interact with others. Therefore, they consciously selected tools depending on the purpose, which may be due to the broad functional knowledge that young people have of these tools.

PCA revealed twenty-two components that had eigenvalues greater than one and which explained 67,2% of the total variance. Visual inspection of the scree plot indicated that five components should be retained. In addition, a five-component solution met the interpretability criterion. As such, five components were retained.

The five-component solution explained 35.99% of the total variance. The Varimax orthogonal rotation was employed to aid interpretability. The rotated solution exhibited 'simple structure' (Thurstone, 1947). The interpretation of the data was consistent with the use of technology tools and academic performance to measure academic success with strong loadings of blogging items, on Component 1 that explained 11,16% of variance, podcasting items on Component 2 which elucidated 9,33% of variance, wikis items on Component 3 that explained 6,60% of variance, instant messaging items on Component 4, which elucidated 4,46% of variance, and academic performance items on Component 5 that explained 4,42% of variance. In addition, the questionnaire had a high level of internal consistency as determined by a Cronbach's alpha of 0.800.

2.3. Procedure

After the questionnaire had been designed, it was validated by five experts from Spanish universities, and its application in educational centres was authorized by General Directorate of Innovation and Educational Equity in Castile and Leon, in accordance with deontological standards for scientific research. Various educational centres (schools and colleges) providing Compulsory Secondary Education were informed about the study. To this end, initial telephone contact was established with the head teachers of the respective centres, and then, prior to

administration of the questionnaire, informed consent was sought and obtained from the nine educational participating centres. The instrument was administered in the classrooms during the tutoring period in order to minimize interference with students' education. For the same reason, questionnaire administration required a maximum of 20 min for each group of students.

3. Analysis and results

3.1. Descriptive analysis

To answer research question 1, on adolescent students' patterns of use of technology tools, we analysed descriptive statistics for the variables corresponding to the following items: use, frequency, time spent, purpose, place of use and levels of satisfaction for five technology tools (search engines, wikis, blogs, podcasts and instant messaging)

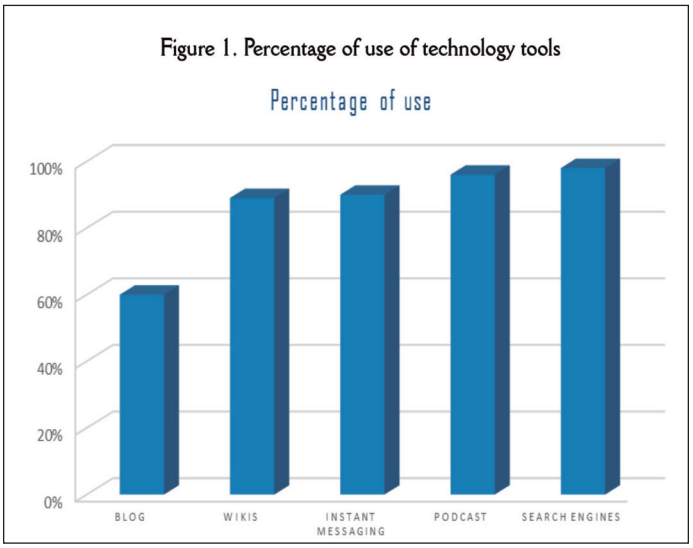
First, in relation to use, as presented in Figure 1, almost all students reported using search engines such as Google or Safari (98%) and instant messaging such as WhatsApp or Telegram (96%), followed by podcast (90%), wikis (89%) and blogs (60%).

In regard to frequency, adolescents stated that they used instant messaging (79%) and podcasts (55%) every day, and search engines (49%) and wikis (34%) several times a week. For time spent, students indicated that they spent between one and three hours a day using tools such as podcasts (45%) and instant messaging (38%), whereas they spent less than one hour a day using other tools such as wikis (67%) and search engines (51%).

With regard to purpose, 86% reported using search engines and wikis to carry out academic homework and tasks [e.g. Fhomework=1293 versus Fsocial interaction=456; p<.001] [e.g. $F_{homework}$=1283 versus $F_{social\ interaction}$=26; p<.001]. Meanwhile, 87% reported using podcasts for entertainment [e.g. $F_{entertainment}$=1306 versus $F_{homework}$=230; p<.001] and instant messaging to interact with others [e.g. $F_{social\ interaction}$=1304 versus $F_{homework}$=321; p<.001].

In relation to the place of use, the tools were mainly used in the home. Thus, home was the place where 95% reported using search engines [e.g. F_{home}=1413 versus F_{school}=388; p<.001], 91% instant messaging [e.g. F_{home}=1368 versus F_{school}=123; p<.001], 89% podcasts [e.g. F_{home} =1328 versus F_{school} =99; p<.001] and 84% wikis [e.g. Fhome=1262 versus F_{school}=335; p<.001]. Finally, as shown in Figure 2 (next page), students' level of satisfaction with the tools was high in the case of instant messaging (81.5%), podcasts (73%) and search engines (60%), and average in the case of wikis (50%) and blogs (14%).

Figure 1. Percentage of use of technology tools



3.2. Multivariate Linear Analysis (GLM)

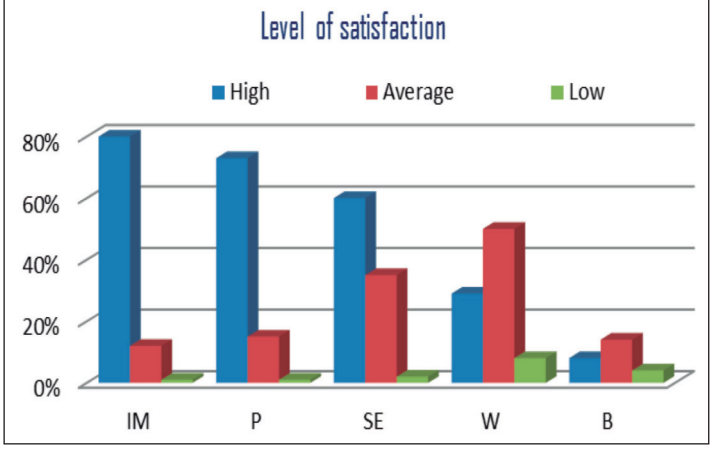
To answer research question 2, on the influence of the use of technology tools on adolescent students' academic performance, we carried out multivariate analyses where between-subject factors were the questionnaire variables referring to students' academic performance in four core subjects (science, mathematics, Spanish language, and English) and grouping variables were gender, educational level, age and use of tools.

Application of the GLM revealed statistically significant multivariate contrasts. The Durbin-Watson statistic yielded a value of 1.956 for the independence of residuals. The R2 for the general model was 56.8% with an adjusted R2 of 55.4%, indicating a large effect size when considering gender, age, educational level and use of tools in the subjects, since we obtained statistically significant differences in students' academic performance (F [41,1224]=39.306, p<0.0005).

Tests for between-subject effects when considering gender, age, educational level and use of tools as grouping

variables, yielded statistically significant differences. In addition, a post-hoc analysis and contrast of means for academic performance in the four core subjects (science, mathematics, Spanish language, and English) also evidenced statistically significant differences. Therefore, we obtained statistically significant differences in students' academic performance in the four subjects analysed, and in performance in the trimester and the previous academic year.

Figure 2. Level of satisfaction with tools. IM="Instant Messaging", P="Podcast", SE="Search Engines", W="Wikis" and B="Blogs"



In science, we found statistically significant differences in student performance according to age and use of tools. As it can be seen in Table 1, taking age as the grouping variable, we observed differences in the mark of students aged between 12 and 15 years old and those aged between 16 and 17, in favour of the youngest [e.g., $M_{12yrs}=2.63$ versus $M_{17yrs}=1.44$; $p<.001$]. As regards to the use of tools, we found differences between students who used search engines, wikis, podcasts and blogs on science, and those who did not use them, whereby students who routinely used these tools presented better performance [e.g., $M_{UseOfSearchEngines}=2.64$ versus $M_{Non\text{-}UseOfSearchEngines}=2.39$; $p< .001$].

In mathematics, as shown in Table 2, we obtained statistically significant differences in student performance according to educational level, age and use of tools. With regard to educational level, we observed differences between 1st and 2nd-year students and those in their 4th year, in favour of the former [e.g., $M_{1stCSE}=2.44$ versus $M_{4thCSE}=2.16$; $p<.001$]. In addition, for age, we found differences between students aged 12 and 13 years old and those aged 17, in favour of the younger students [e.g., $M_{12yrs}=2.52$ versus $M_{17yrs}=1.63$; $p=.001$]. Lastly, in relation to use of tools, we detected differences in mathematics between students who used podcasts and those who did not, whereby the former presented better performance [e.g., $M_{UseOfPodcasts}=2.57$ versus $M_{Non\text{-}UseOfPodcasts}=2.29$; $p=.002$].

In the Spanish language, we found statistically significant differences in student performance according to the four grouping variables; gender, educational level, age and use of tools, as presented in Table 3. With regard to gender, females presented better performance in this subject [e.g., $M_{Female}=2.59$ versus $M_{Male}=2.26$; $p<.001$]. In relation to educational level, we observed significant differences in the mark between 2nd-year students and those in the 1st and third years, in favour of the former [e.g., $M_{2nd\text{-}CSE}=2.57$ versus $M_{1stCSE}=2.36$; $p=.008$]. Regarding age, we found differences between students aged between 12 and 16 years old and those aged 17, in favour of the former [e.g., $M_{12yrs}=2.47$ versus $M_{17yrs}=1.53$; $p<.001$].

Table 1. Differences in science performance

			M	p				M	p
Age	12 vs. 16	12	2.63	.001	Use of tools	Search engines	Yes	2.64	<.001
		16	2.07				No	2.39	
	12 vs. 17	17	1.44	<.001		Wikis	Yes	2.66	<.001
	13 vs. 16	13	2.53	.018			No	2.45	
		16	2.07			Podcast	Yes	2.75	.002
	13 vs. 17	17	1.44	<.001			No	2.50	
	14 vs. 16	14	2.67	<.001		Blogs	Yes	2.67	.035
		16	2.07				No	2.51	
	14 vs. 17	17	1.44	<.001					
	15 vs. 16	15	2.53	.018					
	15 vs. 17	16	2.07						
		17	1.44	<.001					

Note. Only variables that show statistically significant results are displayed ($p< .05$)

Lastly, in relation to the use of tools, we detected differences in student performance between those who used

search engines and those who did not, in favour of the former [e.g., $M_{UseOfSearchEngines}$=2.50 versus $M_{Non-UseOfSearchEngines}$=2.39; p=.036] and between students who used blogs on this subject and those who did not, whereby the former presented better performance [e.g., $M_{UseOfBlogs}$=2.45 versus $M_{NonUseOfBogs}$=2.23; p=.010].

In the English language, as shown in Table 4 (next page) we obtained statistically significant differences in student performance according to all four grouping variables. In relation to gender, females displayed better mean performance [e.g. M_{Female}=2.64 versus M_{Male}=2.42; p<.001]. As regards to educational level, we observed significant differences in the mark between 1st year students and those in the 4th year, in favour of the former [e.g., M_{1stCSE}=2.62 versus M_{4thCSE}=2.42; p=.038]. Regarding age, we detected differences between students aged 12 to 16 years old and those aged 17, and between students aged 12 and 13 years old and those aged 16, in all cases in favour of the younger students [e.g., M_{12yrs}=2.76 versus M_{17yrs}=1.38; p<.001].

Table 2. Differences in mathematics performance

			M	p
Educational level	1_{stCSE} vs 4_{thCSE}	1_{stCSE}	2.44	<.001
		4_{thCSE}	2.16	
	2_{ndCSE} vs 4_{thCSE}	2_{ndCSE}	2.40	.004
		4_{thCSE}	2.16	
Age	12 vs. 16	12	2.52	.005
		16	2.01	
	12 vs. 17	12	2.52	.001
		17	1.63	
	13 vs. 17	13	2.39	.007
		17	1.63	
Use of tools	Podcasts	Yes	2.57	.002
		No	2.29	

Note. Only variables that show statistically significant results are displayed (p< .05)

In regard to the use of tools, we found differences between students who used search engines in this subject and those who did not, and between those who used podcasts and those who did not. In both cases, students using these technologies in the subject presented better performance [e.g. $M_{UseOfPodcasts}$=2.83 versus $M_{Non-UseOfPodcasts}$=2.48; p<.001].

In relation to the performance of students in all subjects in the previous trimester, statistically, significant differences were observed according to gender and age. As regards to gender, females obtained a better mean mark [e.g., M_{Female}=2.60 versus M_{Male}=2.37; p<.001], while for age, we found differences between students aged 12 to 15 years old and those aged 17, whereby the younger students presented better performance [e.g., M_{12yrs}=2.63 versus M_{17yrs}=1.53; p<.001].

In relation to the performance of students in all subjects in the previous academic year, statistically, significant differences were observed according to all four grouping variables. As regards to gender, females obtained a better mark [e.g., M_{Female}=2.86 versus M_{Male}=2.66; p<.001]. For educational level, we observed significant differences between 1st and 2nd-year students, in favour of the former [e.g., M_{1stCSE}=2.86 versus M_{2ndCSE}=2.69; p=.050].

Turning to age, we obtained differences between students of all ages except those aged 16, whereby the youngest students achieved the highest mean mark [e.g., M_{12yrs}=3.01 versus M_{17yrs}=2.00; p<.001].

Table 3. Differences in Spanish language performance

			M	p				M	P
Gender	Males		2.26	<.001	Age	12 vs. 17	12	2.47	<.001
							17	1.53	
	Females		2.59			13 vs. 17	13	2.51	<.001
							17	1.53	
Educational level	1_{stCSE} vs 2_{ndCSE}	1_{stCSE}	2.36	.008		14 vs. 17	14	2.42	<.001
		2_{ndCSE}	2.57				17	1.53	
	2_{ndCSE} vs 3_{thCSE}	2_{ndCSE}	2.57	.030		15 vs. 17	15	2.48	<.001
		3_{thCSE}	2.38					1.53	
Use of tools	Search Engines	Yes	2.50	.036		16 vs. 17	16	2.21	.045
		No	2.39				17	1.53	
	Blogs	Yes	2.45	.010					
		No	2.23						

Note. Only variables that show statistically significant results are displayed (p< .05)

Lastly, in relation to use of tools, we detected differences in student performance between those who used wikis and those who did not, in favour of the former [e.g., $M_{UseOfWikis}$=2.79 versus $M_{Non-UseOfWikis}$=2.62; p=.016] and between those who used blogs and those who did not, in favour of the latter [e.g., $M_{Non-UseOfBlogs}$=2.80 versus $M_{UseOfBlogs}$=2.75; p<.001].

4. Discussion and conclusions

The aim of this study was to analyse adolescent students' use of five technologies (search engines, wikis, blogs,

podcasts and instant messaging) and determine the impact of such use on their academic performance in four core subjects (science, mathematics, Spanish language, and English).

First, our results indicate that these adolescents knew about and used all the tools analysed. Nine out of ten students aged between 12 and 18 years old conducted Internet searches, viewed or shared audio and video files, consulted information on wikis and used instant messaging applications. This evidences that young people today make heavy use of such technologies, in agreement with the results obtained in various other studies (Gross, Juvonen, & Gable, 2002; Valkenburg & Peter, 2007). We also found that our subjects mainly used these technologies in the home. Thus, although increasing use is made of technology tools in the classroom, there is still a clear tendency to use them outside of the school context.

Table 4. Differences in English language performance

			M	p				M	p
Gender	Males		2.42	<.001	Age	12 vs. 16	12	2.76	<.001
							16	2.13	
	Females		2.64			12 vs. 17	12	2.76	<.001
							17	1.38	
Educational level	1_{stCSE} vs 4_{thCSE}	1_{stCSE}	2.62	.038		13 vs. 16	13	2.57	.037
		4_{thCSE}	2.42				16	2.13	
Use of tools	Search Engines	Yes	2.67	<.001		13 vs. 17	13	2.57	<.001
							17	1.38	
		No	2.43			14 vs. 17	14	2.50	<.001
							17	1.38	
	Podcasts	Yes	2.83	<.001		15 vs. 17	15	2.53	<.001
							17	1.38	
		No	2.48			16 vs. 17	16	2.13	0.37
							17	1.38	

Note. Only variables that show statistically significant results are displayed (p< .05)

In addition, a detailed analysis of questionnaire responses revealed differential patterns in the use of technologies according to purpose. Adolescents used tools such as search engines and wikis to do homework and academic tasks, podcasts for entertainment and instant messaging to interact with others. Therefore, they consciously selected tools depending on the purpose, which may be due to the broad functional knowledge that young people have of these tools (García-Martín & García-Sánchez, 2013).

Second, in relation to the positive influence on academic performance exerted by use in the classroom of the five technology tools examined, it should be noted that our results revealed differential patterns in performance according to the variables gender, age and use of tools.

Females presented significantly better mean performance than males in the linguistic subjects of Spanish language and English. These results coincide with those reported in several other studies (Cerezo & Casanova, 2004; Costa & Tabernero, 2012; Sheard, 2009), and may be due to stronger development of communication skills in females. Meanwhile, younger adolescents aged 12 and 13 years old presented better performance in all four areas (science, mathematics, Spanish language, and English), in contrast with the results reported in other studies indicating that older adolescent students display the best performance (Sheard, 2009). The results obtained can be explained by the existence of a higher number of students aged 14 to 18 who were repeating a year.

Lastly, this study indicates that use of technology tools in the classroom significantly affects adolescent students' performance in the subjects analysed (science, mathematics, Spanish language, and English), exerting a positive influence on science, Spanish language, and English and a negative one on mathematics. In this respect, students who used search engines presented significantly better performance in Science, Spanish language and English. Meanwhile, in mathematics, students who did not use any technology tool in the classroom, except podcasts, presented significantly better performance. These results partially coincide with those obtained in other studies indicating that use of the same technology tool in education can have a positive impact in some areas and a negative one in others (Antonijevic, 2007; Torres-Díaz, Duart, Gómez-Alvarado, Marín-Gutiérrez, & Segarra-Faggioni, 2016).

Our results add to the literature on the use of technologies and academic performance and represent the first step in research on the academic effects on adolescent students of the use of various technology tools. The present study has significant implications for the use of technologies in the classroom, as it is important that teachers know

when and why young people use technologies, which ones they use and which ones exert positive influences on adolescent students' academic performance when used in the classroom.

Teachers must carefully select technology tools according to the subjects to address because it has been shown that writing, publishing and reading blog content is an effective means to teach and learn one's native language. Similarly, information searches, translations and listening to or viewing audio and video files are useful for teaching and learning a foreign language.

However, this study presents some limitations. This was a cross-sectional study since data were collected in a single moment in time. It would be desirable to conduct longitudinal research to understand students' academic performance throughout the entire secondary stage. In addition, besides self-report data from students, future research should include other measures of the use of technologies and academic performance when possible. It would also be useful to conduct more studies on the way in which use of other technology tools can enhance academic performance. The ultimate aim of such research would be to provide a quality education for adolescent students.

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References

Antonijevic, R. (2007). Usage of computers and calculators and students' achievement: Results from TIMSS 2003. *International Conference on Informatics, Educational Technology and New Media in Education*. Sombor, Serbia. https://bit.ly/2A4HiQT

BOCYL (Ed.) (2015). *Orden Edu/336/2015, de 27 de abril, por la que se regula el procedimiento para la obtención de la certificación en la aplicación de las tecnologías de la información y la comunicación, por los centros docentes no universitarios*. Valladolid, 2015-05-06, n. 84, 30622. https://bit.ly/2zzGsuZ

Cerezo, M.T., & Casanova, P.F. (2004). Diferencias de género en la motivación académica de los alumnos de Educación Secundaria Obligatoria. *Electronic Journal of Research in Educational Psychology, 2*(3), 97-112. https://doi.org/10.25115/ejrep.3.125

Cetinkaya, L. (2017). The impact of WhatsApp use on success in education process. *International Review of Research in Open and Distributed Learning, 18*(7), 59-74. https://doi.org/10.19173/irrodl.v18i7.3279

Costa, S., & Tabernero, C. (2012). Rendimiento académico y autoconcepto en estudiantes de Educación Secundaria Obligatoria según el género. *Revista Iberoamericana de Psicología y Salud, 3*(2), 175-193. https://bit.ly/2ranaYF

Duart, J.M., Gil, M., Pujol, M., & Castaño, J. (2008). *La universidad en la sociedad Red. Usos de la Internet en Educación Superior.* Barcelona: Ariel.

García-Martín, J., & García-Sánchez, J.N. (2013). Patterns of Web 2.0 tool use among young Spanish people. *Computers & Education, 67*, 105-120. https://doi.org/10.1016/j.compedu.2013.03.003

Gil, J. (2012). Utilización del ordenador y rendimiento académico entre los estudiantes españoles de 15 años. *Revista de Educación, 357*, 375-396. https://bit.ly/2U8VuAB

Gross, E.F., Juvonen, J., & Gable, S.L. (2002). Internet use and well-being in adolescence. *Journal of Social Issues, 58*, 75-90. https://doi.org/10.1111/1540-4560.00249

Han, I., & Shin, W.S. (2016). The use of a mobile learning management system and academic achievement of online students. *Computers & Education, 102*, 79-89. https://doi.org/10.1016/j.compedu.2016.07.003

Jonassen, D.H., & Kwon, H. (2001). Communication patterns in computer mediated versus face-to-face group problem solving. *Educational Technology Research and Development, 49*(1), 35-51. https://doi.org/10.1007/bf02504505

Junco, R. (2015). Student class standing, Facebook use, and academic performance. *Journal of Applied Developmental Psychology, 36*, 18-29. https://doi.org/10.1016/j.appdev.2014.11.001

Kaiser, H.F. (1974). An index of factorial simplicity. *Psychometrika, 39*, 32-36. https://doi.org/10.1007/bf02291575

Montes-Vozmediano, M., García-Jiménez, A., & Menor-Sendra, J. (2018). Teen videos on YouTube: Features and digital vulnerabilities. [Los vídeos de los adolescentes en YouTube: Características y vulnerabilidades digitales]. *Comunicar, 54*(26), 61-69. https://doi.org/10.3916/C54-2018-06

Ndege, W., Mutavi, T., Kokonya, D., Nekesa, V., Musungu, B., Obondo, A., & Wangari, M. (2015). Social networks and students' performance in secondary schools: Lessons form an Open Learning Centre, Kenya. *Journal of Education and Practice, 6(21), 171-178. https://bit.ly/2DPqvDW*

Noshahr, R., Talebi, B., & Mojallal, M. (2014). The relationship between use of cell-phone with academic achievement in female students. *Applied Mathematics in Engineering, Management and Technology, 2*(2), 424-428. https://bit.ly/2EiKmvB

Pantoja, A., & Huertas, A. (2010). Integración de las TIC en la asignatura de Tecnología de Educación Secundaria. *Pixel-Bit, 37*, 225-237. https://bit.ly/2P8klR7

Risso, A., Peralbo, M., & Barca, A. (2010). Cambios en las variables predictoras del rendimiento escolar en Enseñanza Secundaria. *Psicothema, 22*(4), 790-796. https://bit.ly/2Sglpob

Sheard, M. (2009). Hardiness commitment, gender, and age differentiate university academic performance. *British Journal of Educational Society, 79*, 189-204. https://doi.org/10.1348/000709908X304406

Soler-Adillon, J., Pavlovic, D., & Freixa, P. (2018). Wikipedia in higher education: Changes in perceived value through content contribution.

[Wikipedia en la Universidad: Cambios en la percepción del valor con la creación de contenidos]. *Comunicar*, *54*(26), 39-48. https://doi.org/10.3916/C54-2018-04
Tabatabai, D., & Shore, B.M. (2005). How experts and novices search the Web. *Library & Information Science Research*, *27*(2), 222-248. https://doi.org/10.1016/j.lisr.2005.01.005
Thurstone, L.L. (1947). *Multiple factor analysis*. Chicago, IL: University of Chicago Press.
Torres-Díaz, J.C., Duart, J.M., Gómez-Alvarado, H.F., Marín-Gutiérrez, I., & Segarra-Faggioni, V. (2016). Internet use and academic success in university students. Usos de Internet y éxito educativo en estudiantes universitarios]. *Comunicar*, *48*(24), 61-70. https://doi.org/10.3916/C48-2016-06
Valkenburg, P.M., & Peter, J. (2007). Preadolescents' and adolescents' online communication and their closeness to friends. *Developmental Psychology*, *43*, 267-277. https://doi.org/10.1037/0012-1649.43.2.267
Wentwoth, D.K., & Middleton, J.H. (2014). Technology use and academic performance. *Computers & Education*, *78*, 306-311. https://doi.org/10.1016/j.compedu.2014.06.012
Wittwer, J., & Senkbeil, M. (2008). Is students' computer use at home related to their mathematical performance at school? *Computers & Education*, *50*, 1558-1571. https://doi.org/10.1016/j.compedu.2007.03.001
Yuen, S.C., & Yuen, P.K. (2010). What teachers think about Web 2.0 technologies in education? *16th Annual Sloan Consortium International Conference Online Learning*. Orlando, Florida. https://doi.org/10.1016/j.compedu.2007.03.001

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The use of digital resources and materials in and outside the bilingual classroom

El uso de los recursos y materiales digitales dentro y fuera del aula bilingüe

Dr. Macarena Navarro-Pablo is Associate Professor in the Department of Language Education at the University of Seville (Spain) (mnp@us.es) (http:/orcid.org/0000-0003-1954-0851)

Dr. Yiyi López-Gándara is Assistant Professor in the Department of Language Education at the University of Seville (Spain) (yiyi@us.es) (http:/orcid.org/0000-0002-0068-9085)

Dr. Eduardo García-Jiménez is Full Professor in the Department of Educational Research at University of Seville (Spain) (egarji@us.es) (http:/orcid.org/0000-0002-5885-8267)

ABSTRACT

Research on the integration of digital resources and materials in CLIL contexts is still scant. This article presents the results of a study carried out in eight schools in the province of Seville. Questionnaires and interviews were used to collect the data regarding CLIL teachers' and learners' opinions on the intergration of digital resources and materials in the classroom. The aims of this study are: 1) To analyse teachers' and learners' perceptions on the integration of digital resources and materials in the CLIL classroom; 2) To analyse how the educational stage affects teachers' and learners' perceptions on this use; 3) To analyse the type of digital resources and materials in English that learners use outside the classroom. The following analyses have been carried out: Categorical Principal Components Analysis; Mann-Whitney U test; qualitative content analysis; finally, Pearson correlation coefficients were calculated. Results show that there are discrepancies between teachers' and learners' perceptions regarding the use of digital resources and materials in the classroom; and that these perceptions are affected by the educational stage. This study concludes that the type of resources and materials that learners use outside the classroom is determined by those used in the classroom. However, at home, they are used differently, which is indicative of the need to adapt classroom practices to learners' own independent uses.

RESUMEN

La investigación sobre la integración de recursos y materiales digitales en contextos AICLE es todavía escasa. Este trabajo presenta los resultados obtenidos en ocho centros de la provincia de Sevilla, donde se han recogido las opiniones de alumnado y profesorado AICLE a través de cuestionarios y entrevistas. Los objetivos del estudio son: 1) Analizar las opiniones de los participantes sobre la integración de los recursos y materiales digitales en el aula; 2) Analizar cómo afecta la etapa educativa a las opiniones de ambos grupos; 3) Analizar el tipo de recursos y materiales digitales en lengua inglesa que utiliza el alumnado fuera del aula. Se han llevado a cabo los siguientes análisis: análisis de componentes principales categóricos; prueba no paramétrica U de Mann-Whitney; análisis de contenido; y se ha calculado el coeficiente de correlación de Pearson. Los resultados muestran discrepancias en las percepciones de profesorado y alumnado con respecto al uso de los recursos y materiales digitales en el aula; y que estas percepciones se ven afectadas por la etapa educativa. Este estudio concluye que el tipo de recursos que utiliza el alumnado fuera del aula está condicionado por el uso que se hace de ellos dentro de la misma. Sin embargo, en casa se utilizan de manera diferente, lo que revela la necesidad de adaptar las prácticas de aula a los usos autónomos del alumnado.

KEYWORDS | PALABRAS CLAVE

Content and Language Integrated Learning, bilingual education, instructional materials, mixed method research, primary education, secondary education, informal learning, digital communication.

Aprendizaje Integrado de Contenidos y Lengua Extranjera, enseñanza bilingüe, material didáctico, metodología mixta, educación primaria, educación secundaria, aprendizaje informal, comunicación digital.

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1. Introduction

Both CLIL (Content and Language Integrated Learning) and current methodologies in TEFL (Teaching English as a Foreign Language) fall under the umbrella category of the communicative approach. The communicative shift in language teaching began to take shape in the 1970s when theoretical configurations of linguistic competence (Chomsky, 1965) gave way to more encompassing notions of linguistic proficiency in terms of communicative competence (Hymes, 1972). As part of this new approach, new methodologies and programmes based on communicative principles started to emerge. These included content-based instruction, task-based language teaching, language immersion, bilingual and multilingual programmes, and CLIL (Dalton-Puffer 2011, 2014; Ruiz-de-Zarobe, Sierra, & Gallardo, 2011).

Coyle, Hood, and Marsh (2010) defined CLIL as "an educational approach in which various language-supportive methodologies are used which lead to a dual-focused form of instruction where attention is given both to the language and the content" (p. 3). Due to this dual focus through which both linguistic and non-linguistic contents are integrated into the teaching-learning process, CLIL shares some of the principles of communicative language teaching. Indeed, in Coyle's 4Cs model, communication is, together with content, culture, and cognition, a central aspect of CLIL, as language is used not only as a means of instruction but as a tool to communicate and build knowledge on non-linguistic content. In this process, knowledge is also built around non-linguistic content (Coyle, 2002). Communication in CLIL implies engaging in tasks that meet the following criteria:

1) Tasks must be real: that is, they must replicate what we do with language outside the classroom.

2) Tasks must be purposeful: that is, language use must have a purpose or function.

At the same time, tasks that are truly communicative have three features in common (Larsen-Freeman & Anderson 2000):

1) Information gap: this occurs when one of the interlocutors knows something the other interlocutor does not, and therefore, contributes to filling an information gap.

2) Choice: this refers to the interlocutors' freedom to decide what to say and how to say it.

3) Feedback: this implies that feedback from the interlocutor is required in order to know whether communication has happened.

When one or more of these requirements are not met, communication is not taking place.

In this scenario, the very conceptualisation of communication and communicative competence (the ultimate aim of language teaching and learning -Council of Europe, 2001) makes the CLIL classroom a suitable place for the use of ICTs, as these communicative situations and tasks may be easily reproduced and successfully performed through the use of digital media. Furthermore, digital resources and materials allow for a greater variety of contexts and interlocutors, which are needed so that real and purposeful communication may take place in the classroom.

1.1. Digital resources and materials in CLIL

The use of adequate resources and materials is key to successful teaching and learning: considered in a broad sense (Tomlinson, 1998), they are the mediators between learners and the reality that is the object of study (Manrique & Gallego, 2013). In the case of CLIL, it is through these resources and materials that students gain access to both language and content.

The very characteristics of CLIL described above suggest a methodological preference for the use of digital resources and materials over analogue ones. This is further reinforced by the fact that CLIL's emergence in the 1990s (Pérez-Cañado, 2012; Fernández-Sanjurjo, Fernández-Costales, & Arias, 2017) coincided with the proliferation and popularisation of digital tools and media in education and elsewhere (Henderson & Romeo, 2015). Indeed, the theoretical bases of CLIL rely on, either implicitly or explicitly, on an understanding of the teaching-learning process as mediated by, or even happening in, the digital world (Coyle, 1999; Cummins, 1998). However, the real inclusion of digital resources and materials as an integral part of a whole CLIL pedagogy that fosters learner autonomy, knowledge building, interpersonal communication and collaborative work in the classroom is still far from being realised. The literature also indicates that there is a shortage of CLIL materials capable of linking theory and practice (Fernández-Fontecha, 2012). Table 1 provides a tentative classification of digital resources and materials commonly used in CLIL.

While it is widely acknowledged that the use of these resources and materials per se does not necessarily entail a methodological shift, their potential for transforming educational paradigms is usually recognised (Fernández-Fontecha, 2006, 2012). Thus, in order for this transformation to take place, digital resources and materials must be

seen and used, not in an instrumental way (i.e. as tools), but rather as pathways for building knowledge, or loci for experiencing learning (Lesmes, Rodríguez, & Naranjo, 2010; Merchant, Burnett, & Parry, 2017).

At the same time, it has been argued that, because education is, above all, a communicative process (Martín-Barbero, 2006), it must be necessarily affected by the new ways in which we communicate through digital technologies. These changes refer especially to the development of new ways of thinking, analysing, feeling and communicating that are also central to changes produced at the epistemological level (Lesmes, Rodríguez, & Naranjo, 2010). This idea is also supported by Wong, Chai, & Aw (2017), for whom the new forms of communication imply the need for a new learning paradigm. The development of these epistemological structures finds an appropriate environment in the integration of CLIL and digital resources and materials (Maggi, Cherubim, & García-Pascual, 2014) through the use of, for example, interactive (as opposed to passive) devices such as the interactive whiteboard, which allows for new ways of interacting with information; 2.0 content websites such as blogs and wikis, where knowledge is built collaboratively; synchronous and asynchronous forms of computer and mobile-mediated communication, through which interpersonal communication across time and space is made possible; and virtual environments such as virtual reality experiences and webquests, which promote learner autonomy.

Table 1. Classification of digital resources and materials

Type	Authentic / Teaching-oriented	Examples used in CLIL
Hardware (physical devices)	Both	PCs, laptops, tablets, mobile phones, interactive whiteboards, scanners, cameras, etc.
Software (programmes for creating, running, managing and editing content)	Both	Browsers, office suits, media players, multimedia software, editors, etc.
Files (created, run, managed and edited by software)	Both	Books, music, films, podcasts, etc.
1.0 content websites and applications	Both	Of newspapers, institutions, companies, and products; search engines; online reference material (databases, dictionaries…); games; virtual environments; etc.
2.0 content websites and applications	Both	Blogs, wikis, message boards, listing sites, video sharing sites, etc.
Social media	Both	Virtual communities, social networks, etc.
Communication services	Both	E-mailing, videoconferencing, instant messaging, etc.
Online learning environments	Teaching-oriented	Virtual Learning Environments (VLEs), webquests, online lesson plans, digital textbooks, educational apps, etc.

While there is ample research on the use of digital resources and materials in regular TEFL courses in Secondary Education (Banegas, 2017; Fernández-Fontecha, 2006; Izquierdo, De-la-Cruz-Villegas, Aquino-Zúñiga, Sandoval-Caraveo, & García-Martínez, 2017; Marsh, 2010; Wong, Chai, & Aw, 2017), research focused on CLIL at primary level is scant. This is mainly due to the fact that CLIL is a fairly recent methodology. Early research on CLIL concerned itself with conceptualisations and characterisations of the methodology (Coyle, 2008; Coyle, Hood & Marsh, 2010; Dalton-Puffer, 2011; Pérez-Cañado, 2012). This was followed by research focused on measuring learners' foreign language proficiency levels (Admiraal, Westhooff, & De Bot, 2006; Lasagabaster, 2008; Dalton-Puffer, 2011), as well as their mastery of specific communicative subcompetences, skills or systems (Lasagabaster, 2007; Nieto, 2016), and how these are affected by other variables such as contextual factors, individual learner characteristics or motivation (Lasagabaster, 2011; Fernández & Canga, 2014; Doiz & Lasagabaster, 2014; Sylvén & Thomson, 2015). It is only recently that attention has been drawn to CLIL resources and materials, with several studies providing descriptions of materials that can be used in CLIL classrooms, frameworks and guidelines for material design and evaluation, and specific examples of CLIL activities (Banegas, 2017; Ball, Kelly, & Clegg, 2015; Coyle, Hood, & Marsh, 2010; Fernández-Fontecha, 2012; Mehisto, 2012; Meyer, 2010; Moore & Lorenzo, 2007, 2015; Morton, 2013; Smit, 2007). All of these are indicative of a lack of CLIL materials. However, there are no studies on the real use and integration of digital resources and materials in CLIL classrooms, teachers' and learners' perceptions of this, and their use outside the school setting.

These are the aspects addressed in this study, which seeks to answer the following research questions:

- RQ1. How do teachers and students perceive the use of digital resources and materials in the CLIL classroom?

• RQ2. How does the educational stage (Primary and Secondary Education) affect teachers' and learners' perceptions of the use of these resources and materials?

• RQ3. What kind of digital resources and materials in English do CLIL learners use outside of school?

2. Methods

This article draws on data and findings from a larger research project, "The effects of Content and Language Integrated Learning in monolingual communities: A large-scale evaluation". The present study was carried out in eight different schools (both urban and rural) in the province of Seville (Spain). The participants were the teachers and learners involved in CLIL programmes in these schools; these included foreign language (FL) teachers, non-linguistic area (NLA) teachers, language assistants, and students. A mixed methods approach was used, more specifically, a convergent parallel design (Creswell, 2014). Four data-collection techniques were used: (1) direct observation, in order to obtain information about the actual use of digital resources and materials in the classroom; (2) semi-structured interviews to explore teachers' and learners' opinions on the use of digital resources and materials and contrast the information collected by means of other techniques; (3) a general questionnaire in different versions for teachers and students, designed and validated in Spanish and English; and (4) an extramural exposition questionnarie to determine learners' use of digital resources and materials outside the school setting. Both the general questionnaire and the interviews include opinion questions to explore the respondents' thoughts and outlook on the CLIL resources and materials used in the classroom. The combination of all these techniques ensured that information was collected in an objective and uniform way. The quantitative analysis was based on the answers to the general questionnaire by 137 students and 38 teachers. The qualitative part of the study was based on the observation of 14 classes, and interviews with a total of 70 students and 24 teachers.

3. Analyses and results

The internal consistency of teachers' and students' questionnaires was detemined by calculating Cronbach's alpha coefficient. In the questionnaire administered to teachers, this coefficient was 0.919 and, in the questionnaire applied to the student, it was 0.886. A Categorical Principal Components Analysis (CAPTCA) (rotation method: Varimax with Kaiser normalisation) was used to asses construct validity. This analysis also allowed us to reduce the information gathered from the questionnaires and to distinguish between teachers' and learners' perspectives. Finally, in order to contrast the differences between teachers' and learners' opinions both at a primary and secondary level, a Mann-Whitney U test was applied.

A content analysis was performed on data collected from direct classroom observation and teachers' and students' interviews. A cross matrix was created fom the analysis of the differences between FL and NLA teachers, both in Primary and Secondary Education. This qualitative analysis made it possible to contrast and interpret the quantitative data from the questionnaires. Finally, Pearson correlation coefficients were calculated to establish correlations among the different digital resources and materials that students used outside the classroom, again both at a primary and secondary level.

3.1. Perceptions of the use of digital resources and materials

Regarding the first research question, a CAPTCA analysis allowed us to reduce the information collected in the questionnaires and distinguish, for both teachers and students, two principal components that can explain the variability in respondents' answers. CAPTCA is similar to principal component analysis (sometimes considered a factor extraction method in factor analysis) when data are measured using ordinal or interval scales. As Table 2 (next page) shows, component 1 in the teachers' questionnaire (items 7, 8, 9, 10 and 11, which correspond to multimedia software; online reference materials; blogs, wikis and webquests; interactive whiteboards; and computer-mediated communication, respectively) and component 2 in the learners' questionnaire (items 7, 8, 9 and 10) are almost identical. These components allowed us to identify those items that were explicitly related to the use of digital resources and materials and recognised as such by respondents. In the case of teachers, item 4 (collaboratively made bilingual teaching materials) did not fit this pattern, as it was associated with factorial weights in both components; this may be due to the fact that they assigned more importance to the collaborative element than to the type of materials that were generated; on the other hand, students clearly associated this item with the use of digital resources and materials in the classroom.

Figure 1 (next page) shows the spatial arrangement of these components: items associated with digital resources

and materials on the one hand, and the rest of the items on the other. Component 1, located on the horizontal axis and with a wider range of scores, had somewhat higher saturation levels (variance explained=28.25%) for items referring to digital resources (see lower quadrants). On the contrary, the rest of the items are located in the upper quadrants, with lower saturation levels (variance explained=27.04%). These data show a clear distinction between digital materials and resources and other types of materials.

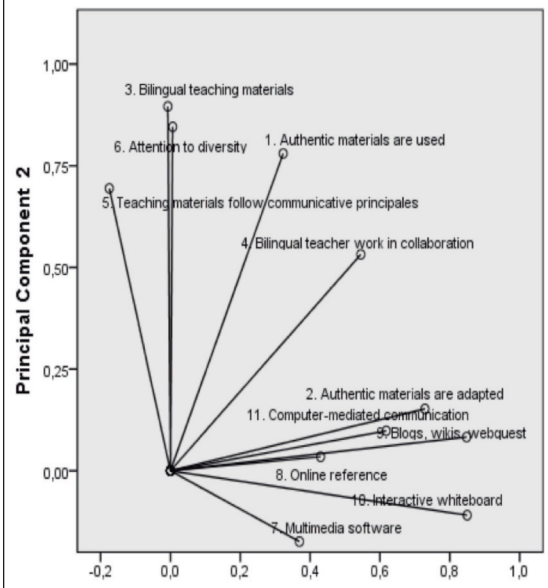
Table 2. Rotated component loadings

	Teachers		Students	
	1	2	1	2
1) Authetic materials for bilingual teaching are used	0.323	0.780	0.626	-0.053
2) Authetic materials for bilingual teaching are adapted	0.729	0.152	0.629	-0.100
3) Bilingual teaching materials are interesting and innovative	-0.007	0.896	0.722	0.155
4) Bilingual teachers work in collaboration to prepare and deliver the bilingual teaching materials in class	0.545	0.532	0.745	0.038
5) The bilingual teaching materials used follow communicative principles	-0.175	0.694	0.571	0.467
6) Attention to diversity is always taken into account when bilingual teaching materials are being designed	0.007	0.846	0.616	0.273
7) Multimedia software is used in class	0.369	-0.174	0.274	0.767
8) Online reference materials are used in class	0.430	0.035	0.213	0.777
9) Blogs, wikis, and webquest are used in class	0.848	0.083	-0.014	0.718
10) Interactive whiteboards are used in class	0.850	-0.109	-0.051	0.425
11) Computer-mediated communication is used in class (e.g., e-Twinning)	0.618	0.098	0.372	0.154

Figure 2 (next page) shows the spatial arrangement of the main components obtained from the CAPTCA based on learners' responses. In this case, the spatial arrangement is an inversion of that shown in Figure 1. Thus, the highest saturation levels are located in the upper quadrants, corresponding to items that do not explicitly refer to digital resources and materials (explained variance=25.73%), whereas the lowest saturation levels appear in the lower quadrants (explained variance=20.40%). These correspond to items explicitly related to digital resources and materials. It is interesting to note that, as opposed to teachers, learners associated item 11 (computer-mediated communication) with items not expressly related to digital resources and materials.

These data indicate that, generally, both teachers and students identify and classify digital resources and materials in a similar way. However, differences are found in their interpretation of their frequency of use in the classroom, with teachers perceiving a higher frequency of use than learners. These differences seem to be due to respondents' different knowledge of and experience in the use of digital resources and materials, which distinguishes between teachers and learners, and between ICT-trained and non-ICT trained teachers.

Figure 1. Component loadings plot (Teachers)



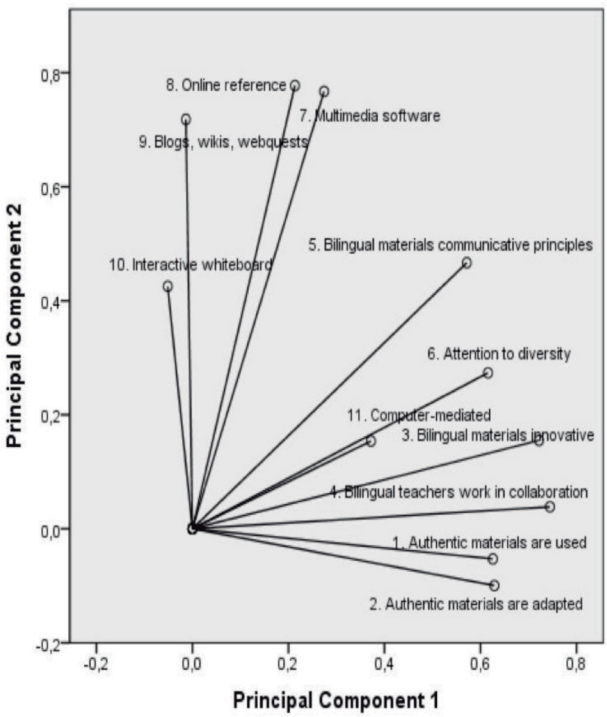
3.2. The effect of the educational stage on teachers' and learners' perceptions

With respect to the two educational stages under study, the data indicate that teachers' and learners' perceptions of the use of digital resources and materials differ at both primary and secondary level. In Primary Education, teachers' means are generally higher (above 3) than those of students (below 3), except for item 1 (authentic materials), for which teachers' mean is below 3, and item 11 (computer-mediated communication), for which teachers' mean is below 3 and students' mean below 2. As Table 3 shows, if we consider only the items explicitly related to digital resources and materials, items 7, 8 and 10 (multimedia software; online reference materials; and interactive whiteboards, respectively) obtain similar percentages, with higher values for teachers (100%, 100% and 94.2% respectively) and lower

values for learners (86.9%, 73.6% and 82.4% respectively). Both groups agree that the resources and materials in item 9 (blogs, wikis, and webquests) are used less in the classroom (88.2% for teachers and 66.2% for learners). Similarly, these data show that item 11 (computer-mediated communication) is rarely used (35.2% for teachers and 16.2% for students).

In Secondary Education, there is a higher degree of concurrence between teachers' and learners' responses. The means for most items exceed 3, except for items 9 and 11. In the case of learners, mean values are, in general, above 3, with the exception of items 2, 3 and 11. Again, Table 3 shows the percentage of use of digital resources and materials only: item 8 (online reference materials) is the most widely used resource (95.3% for teachers and 88.4% for learners), followed by item 10 (interactive whiteboards), which, according to 90.4% of teachers and 88.4% of students are used in class. Again, as in Primary Education, respondents report less use of resources and materials in item 9, but in this case, the percentage for teachers is even lower than that of learners (71.4% and 88.4% respectively). Finally, agreements between teachers' and students' perceptions are found when considering item 7 (61.9% for teachers and 66.7% for students) and item 11 (47.6% of teachers and 52.3% of students).

Figure 2. Component loadings plot (Learners)



The most notable differences between results in Primary and Secondary Education were found when analysing learners' opinions. Table 4 shows the results of the Mann-Whitney U test. It reveals statistically significant differences in the opinions of primary and secondary learners: secondary students report significantly more frequent use of digital resources and materials in English outside the school setting than primary learners. The only exception is item 2 (adapted authentic materials), where no statistically significant differences were found between primary and secondary students; this is probably due to differences in interpretation of the item, as learners may not have a clear picture of what adapted materials may be.

Now, regarding the opinions of teachers at both educational levels, no statistically significant differences were shown in the data, except for items 2 and 3 (adapted authentic materials and innovative bilingual materials). Likewise, the opinions of FL and NLA teachers were also not significantly different in terms of their perception on the use of resources and materials, with the exception of item 7 (multimedia software), which was most used by FL teachers.

In spite of the differences between teachers and learners, there were some similarities in respondents' answers if we take into account only the digital resources and materials: most respondents agreed that items 8 and 10 (online reference materials and interactive whiteboards) are more frequently used than items 9 and 11 (blogs, wikis and webquests, and computer-mediated communication). The information provided by the quantitative data was supported by the information provided by the qualitative data obtained through classroom observation and interviews. Table 5 summarizes these qualitative data.

The information obtained in the interviews showed that both authentic and adapted materials are used in CLIL. Books are mainly used for FL classes and some NLA ones. In general, teachers stated that there are not enough resources available for CLIL delivery. Some schools do use online resources, both at primary and secondary levels. Students in Primary Education indicated that they do not use blogs, wikis or webquests, although teachers stated that they

are used in the classroom. In Secondary Education, both teachers and students agreed on some use of blogs, wikis, and webquests. Finally, the interactive whiteboardis used, but most respondents coincided that these are mainly used as projectors.

3.3. Learners' out-of-school use of digital resources and materials in English

In relation to the last research question, the questionnaires on extramural exposition provided information on the number of hours learners spend on English language activities outside of school and the digital resources they use. At the primary level, video games and songs are the most widely used. Primary school students also do other activities such as watching TV shows and films, reading books and magazines, but they devote fewer hours to these. In Secondary Education, listening to songs is the activity done by most respondents. Other activities to which they devote an important amount of time are the Internet and videogames. Finally, they spend fewer hours watching TV shows, reading books and magazines, and watching films.

Table 3. Percentage of use of digital resources and materials

		Primary Education		Secondary Education	
		Teachers	Learners	Teachers	Learners
7) Multimedia software is used in class	Strongly disagree/ Disagree		13.3	38.1	33.3
	Agree/ Strongly agree	100	86.9	61.9	66.7
8) Online reference materials are used in class	Strongly disagree/ Disagree.		26.5	4.8	11.6
	Agree/ Strongly agree	100	73.6	95.3	88.4
9) Blogs, wikis, and webquests are used in class	Strongly disagree/ Disagree	11.8	33.8	28.6	11.5
	Agree/ Strongly agree	88.2	66.2	71.4	88.4
10) Interactive whiteboards are used in class	Strongly disagree/ Disagree	5.9	17.7	9.5	11.6
	Agree/ Strongly agree	94.2	82.4	90.4	88.4
11) Computer-mediated communication is used in class (e.g., e-Twinning)	Strongly disagree/ Disagree	64.4	83.2	52.3	47.8
	Agree/ Strongly agree	35.3	16.2	47.6	52.3

There are positive and statistically significant correlations between these resources and materials. Table 6 (https://figshare.com/s/4cc23be1ec9a1bb5f917) illustrates the correlations between the different types of resources and materials that primary learners use in English outside of school. Interestingly, there is a positive and statistically significant correlation between internet use and a variety of activities (reading books, watching films and listening to songs). These correlations may indicate that when students access the Internet, they do so mainly to read digital books, watch films and listen to music online.

Table 7 shows the correlations between the resources and materials used by Secondary Education students outside school (https://figshare.com/s/4cc23be1ec9a1bb5f917). As in Primary Education, there are positive and statistically significant correlations between internet use and other activities. In this case, their use of the Internet seems to be closely related to listening to songs, playing videogames, reading magazines and reading books.

All this is indicative that, even if the type of resources and materials that learners use outside the school is determined by those used in the classroom, new forms of access to the FL, and therefore, new ways of learning are developing through learners' independent uses at home. These uses afford them opportunities for non-segmented and non-graded access to the FL, which differs greatly from the kind of exposure that they receive in the classroom.

4. Discussion and conclusions

This article provides a detailed analysis of the use of digital resources and materials in the CLIL classroom as well as of learners' own independent uses outside the school setting, filling a gap in the burgeoning field of CLIL studies and of digital media in language education. As a main contribution, this study brings to the fore the need to adapt classroom practices to learners' out-of-school use and experience of digital resources and materials. Concerning the first research question regarding teachers' and learners' perceptions on the use of digital resources and materials, both teachers and students grouped these in a similar way: items related to digital resources and materials on the one hand and the rest of the items on the other. However, results regarding their use in the classroom varied,

with teachers acknowledging a much higher use of digital resources and materials than students. There are discrepancies between what teachers and students perceived as high or low use of digital resources and materials in the classroom. This may be due to the fact that they have different knowledge of and experience in the use of these resources and materials. Furthermore, in the case of teachers, lack of training may also account for these discrepancies. When undertrained teachers make use of these resources and materials, they tend to focus on the medium, and not so much on the contents to be delivered, as the medium takes up too much of their time and energy. Therefore, teachers' perceptions of their use might be affected by these psychological factors. This is in accord with what previous research says about undertrained teachers using digital technologies (Scrivener, 2011).

Table 4. Mean, standard deviation and differences between primary and secondary students

	Year 6 in P.E. / Year 4 in S.E.	Mean	Standard deviation	Sig.
1) Authetic materials for bilingual teaching are used	PE	2.49	1.015	0.001
	SE	3.14	0.809	
2) Authetic materials for bilingual teaching are adapted	PE	2.81	0.868	0.841
	SE	2.84	0.980	
3) Bilingual teaching materials are interesting and innovative	PE	2.62	0.962	0.020
	SE	2.96	0.695	
4) Bilingual teachers work in collaboration to prepare and deliver the bilingual teaching materials in class	PE	2.54	1.177	0.001
	SE	3.20	0.719	
5) The bilingual teaching materials used follow communicative principles	PE	2.59	1.096	0.002
	SE	3.07	0.649	
6) Attention to diversity is always taken into account when bilingual teaching materials are being designed	PE	2.22	1.063	0.001
	SE	2.88	0.738	
7) Multimedia software is used in class	PE	3.29	0.734	0.011
	SE	3.59	0.626	
8) Online reference materials are used in class	PE	2.93	0.869	0.001
	SE	3.43	0.696	
9) Blogs wikis and webquests are used in class	PE	2.81	1.055	0.004
	SE	3.28	0.784	
10) Interactive whiteboards are used in class	PE	3.79	0.505	0.009
	SE	3.48	0.851	
11) Computer-mediated communication is used in class (e.g. e-Twinning)	PE	1.44	0.870	0.001
	SE	2.52	1.093	

From all this, it may be concluded that respondents' identification of the types of resources and materials is not an issue at stake here, but rather the interpretation that each group makes of their frequency of use. In this regard, the main contribution of this study to the field is that respondents' varying interpretations are determined mostly by their experience of these resources and materials, which tends to discriminate between teachers and learners on the one hand, and between ICT-trained and non-ICT-trained teachers on the other. Moreover, it seems that novice teachers' experience and use of this kind of resources and materials is closer to that of learners, probably due to more similar patterns of independent access outside of school and, possibly, training. Further research on the contextual determinants of teachers' and learners' experience would be needed to shed light on their perception of the frequency of use of digital resources and materials in the classroom.

In relation to the second research question, when the sample is differentiated according to the educational stage, the data indicated that respondents' opinions differ regarding the use of digital resources and materials. The most notable differences were found in the learners' responses. This may be due to variations in the implementation of the CLIL approach, depending on the learners' needs at each educational stage.

Another variable that may have an effect on this is teacher profile and training; factors also indicated in the literature (Izquierdo & al., 2017). However, common shortcomings in the use of these resources and materials in the two stages have also been identified. Results show that digital sources and materials more likely to, or specifically desiged to, foster collaborative knowledge building, interpersonal communication and learner autonomy (2.0 content websites such as blogs and wikis; social media such as virtual communities; communication services, such as e-mailing and instant messaging; and online learning environments, such as virtual learning environments and webquests) are the least used by teachers, both at primary and secondary level.

Furthermore, even if they make use of devices that could enhance these aspects (for example, the interactive whiteboard), in the classroom these serve the function of analogue devices (i.e., projectors). This is in accord with previous findings regarding traditional uses of digital resources and materials (Fernández-Fontecha, 2006; Izquierdo & al., 2017). As the teachers themselves indicated in the interviews, this may be because there are not enough digital materials available for bilingual teaching, a result that also supports previous findings, as mentioned above.

However, as this study shows, it may not only be a question of lacking specific materials for CLIL but of the difficulties entailed in acknowledging and adequately utilising the opportunities that digital resources offer to set up spaces for interaction and process thinking. Further research into teachers' knowledge of and experience in the use of these resources may provide an insight into these difficulties.

Finally, concerning the last research question, the results of the analyses conducted on the type of resources and materials in English that students use outside of school revealed that songs and videogames are the most widely used in both stages. The most important finding of this analysis was the existence of significant correlations between the activities. These correlations show that, at both levels, learners use the Internet to access reading materials and to listen to songs; primary learners also use it for watching films, while secondary learners use it for playing videogames.

These results indicate that students at both levels have an ongoing interest in using digital resources and materials in English outside of school. Furthermore, these uses replicate those that take place in the classroom, which demonstrates that these resources and materials are helpful in promoting and connecting both formal and informal learning experiences, giving rise to what is known as "seamless learning" (Wong, Chai, & Aw, 2017). This means that what is learned in the classroom does not stay there, but rather is recontextualised continuously and enriched by new uses in real communicative interactions in a variety of contexts and with a variety of interlocutors.

However, the full potential of these processes of recontextualisation is still far from being realised. Whereas the digital resources and materials used in and outside the classroom are the same, the activities in which learners engage in the classroom are passive (reception of knowledge) and offer segmented, graded and decontextualised access to the FL. This contrasts with the kind of activities in which learners engage outside the school setting, where activities are and afford them acess to the FL in a non-segmented and non-graded, more communicative and contextualised way. The main conclusion to be drawn from this is that, in order to adequately exploit the teaching and communicative potential of digital resources and materials for CLIL, these should be used in ways that resemble more closely the ways learners interact with information and access the FL outside of school. These ways are also more communicatively and socially relevant and have a greater potential to foster collaborative knowledge building, interpersonal communication, and learner autonomy. It is necessary to incorporate these aspects in order to help bridge the distance between formal and informal access to knowledge and to truly integrate digital resources and materials in the classroom in accordance with CLIL principles.

Tabla 5. Cross matrix from class observation and semi-structured interviews

	Primary Education		Secondary Education	
	Students	Teachers	Students	Teachers
Authentic materials	-	They use both authentic and adapted materials	All kinds of materials are used	
Adapted or hand-made materials	Non-linguistic-area worksheets and notebook			
Books	In the foreign language class	In the foreign language class	In the foreign language class Non-linguistic-area books if they find any	
Online reference materials	Only 1 school	Some schools	All of them use online reference materials	
Blogs	-	Some schools	Some of them have blogs; others use websites or wikis	
Interactive whiteboard	2 schools, but mainly as a projector	Mainly as a projector	All of them use interactive whiteboards but mainly as a projector	

References

Ball, P., Kelly, K., & Clegg, J. (2015). *Putting CLIL into practice*. Oxford: Oxford University Press. https://doi.org/10.1075/jicb.5.1.07gie

Banegas, D.L. (2017). Teacher developed materials for CLIL: Frameworks, sources, and activities. *Asian EFL Journal*, *19*(3), 31-48. https://bit.ly/2SJqoxU

Chomsky, N. (1965). *Aspects of the theory of syntax*. Cambridge: The MIT Press. https://doi.org/10.21236/ad0616323

Creswell, J.W. (2014). *Research design: Qualitative, Quantitative and mixed methods approaches.* Thousand Oaks, CA: Sage.

Coyle, D. (1999). Theory and planning for effective classrooms: supporting students in content and language integrated learning contexts. In

J. Masih (Ed.), *Learning through a foreign language* (pp.46-62). London: CILT.
Coyle, D. (2002). Relevance of CLIL to the European Commission's Language. In D. Marsh (Ed.), *CLIL/EMILE. The European dimension. Actions, trends, and foresight potential* (pp. 1-25). Córdoba: Universidad de Córdoba.
Coyle, D. (2008). CLIL - A pedagogical approach. In N. Van-Deusen-Scholl, & N. Hornberger (Eds.), *Encyclopedia of language and educa*tion (pp. 97-111). New York: Springer. https://doi.org/10.1007/978-0-387-30424-3_92
Coyle, D., Hood, P., & Marsh, D. (2010). *CLIL: Content and language integrated learning.* Cambridge: Cambridge University Press.
Cummins, J. (1998). Immersion education for the millennium: What have we learned from 30 years of research on second language immersion? In M.R. Childs, & R.M. Bostwick (Eds.), *Learning through two languages: Research and practice. Second Katoh Gakuen International Symposium on Immersion and Bilingual Education* (pp. 34-47). Japan: Katoh Gakuen.
Dalton-Puffer, C. (2011). Content and Language integrated learning: From practice to principles? *Annual Review of Applied Linguistic.* https://doi.org/10.1080/09571736.2014.891370
Dalton-Puffer, C. (2014). You can stand under my umbrella: Immersion, CLIL and bilingual education. A response to Cenoz, Genesee and Gorter. *Applied Linguistics, 35*(2), 213-218. https://doi.org/10.1093/applin/amu010
Fernández-Fontecha, A. (2006). The design of ICT materials for L2 teaching: state of the art. *Interlingüística*, *17*, 333-344. https://bit.ly/2PyPjSM
Fernández-Fontecha, A. (2012). CLIL in the foreign language classroom: Proposal of a framework for ICT materials design in language-oriented versions of content and language integrated learning. *Alicante Journal of English Studies, 25*, 317334. https://doi.org/10.14198/raei.2012.25.22
Fernández-Sanjurjo, J., Fernández-Costales, A., & Arias, J. (2017). Analysing students' content-learning in science in CLIL vs. Non-CLIL programmes: empirical evidence from Spain. *International Journal of Bilingual Education and Bilingualism*. https://doi.org/10.1080/13670050.2017.1294142
Henderson, M., & Romeo, G. (Eds.) (2015). *Teaching and digital technologies*. Cambridge: Cambridge University Press.
Izquierdo, J., De-la-Cruz-Villegas, V., Aquino-Zúñiga, S.P., Sandoval-Caraveo, M.C., & García-Martínez, V. (2017). Teachers' Use of ICTs in public language education: Evidence from second language secondary-school Classrooms. [La enseñanza de lenguas extranjeras y el empleo de las TIC en las escuelas secundarias públicas]. *Comunicar, 50*, 33-41. https://doi.org/10.3916/C50-2017-03
Larsen-Freeman, D., & Anderson, M. (2000). *Techniques and Principles in Language Teaching.* Oxford: Oxford University Press. https://doi.org/10.2307/328245
Lesmes-Sáenz, L.A., Rodríguez-Roncancio, E., & Naranjo-Colorado, L.D. (2010). TIC y educación: Los medios digitales en la educación. *Congreso Iberoamericano de Educación. Metas 2021.* Buenos Aires, 13-14 and 15 of September, 2010.
Maggi, F., Cherubim, M., & García-Pascual, E. (2014). Using Web 2.0 tools in CLIL. In S. Garton, & K. Graves (Eds.), *International perspectives on materials in ELT.* Basingstoke: Palgrave Macmillan. https://doi.org/10.1057/9781137023315.0021
Manrique-Orozco, A.M., & Gallego-Henao, A.M. (2013). El material didáctico para la construcción de aprendizajes significativos. *Revista Colombiana de Ciencias Sociales*, *4*(1), 101-108. https://bit.ly/2zTmSKw
Marsh, J. (2010). Young children's play in online virtual worlds. *Journal of Early Childhood Research 8(*1), 23-39. https://doi.org/10.1177/1476718X09345406
Martín-Barbero, J. (2006). *La educación desde la comunicación.* Bogotá: Norma.
Mehisto, P. (2012). Criteria for producing CLIL learning material. *Encuentro 21*(1), 15-33. https://bit.ly/2Ld7EnX
Meyer, O. (2010). Towards quality-CLIL: Successful planning and teaching strategies. *Pulso 33*, 11-29. https://bit.ly/2rAn2Ss
Moore, P., & Lorenzo, F. (2007). *Adapting authentic materials for CLIL classrooms: An empirical study.* Vienna English Working Papers, 16(3), 28-35. https://bit.ly/2EjCCcO
Moore, P., & Lorenzo, F. (2015). Task-Based learning and content and language integrated learning materials design. Process and product. *Language Learning Journal*, *43*(3), 334-357. https://doi.org/10.1080/09571736.2015.1053282
Morton, T. (2013). Critically evaluating materials for CLIL: Practitioners' practices and perspectives. In J. Gray (Ed.), *Critical perspectives on language teaching materials* (pp.111-136). Basignstoke: Palgrave Macmillan. https://doi.org/10.1057/9781137384263_6
Pérez-Cañado, M. (2012). CLIL research in Europe: Past, present and future. *International Journal of Bilingual Education and Bilingualism 15*(3), 315-341. https://doi.org/10.1080/13670050.2011.630064
Ruiz-de-Zarobe, Y., Sierra., J., & Gallardo, F. (2011). *Content and foreign language integrated learning. Contributions to multilinguals in European contexts*. Berna: Peter Lang. https://doi.org/10.3726/978-3-0351-0171-3
Scrivener, J. (2011). *Learning teaching.* London: Macmillan.
Smit, H. (2007). Free teaching materials for CLIL lessons. In B. Roza-González (Ed.). *Good practice in content and language integrated learning* (pp. 67-69). Gijón: BeCLIL,
Tomlinson, B. (Ed.) (1998). *Materials development in language teaching.* Cambridge: Cambridge University Press.
Wong, L.H., Chai, C.S., & Aw, G.P. (2017). Seamless language learning: Second language learning with social media. [Aprendizaje de idiomas 'sin costuras': Aprendizaje de segundas lenguas y redes sociales]. *Comunicar, 50*, 9-21. https://doi.org/10.3916/C50-2017-01

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Reading and informal learning trends on YouTube: The booktuber

Lectura y aprendizaje informal en YouTube: El booktuber

Arantxa Vizcaíno-Verdú is Communication Researcher with Agora Group at the University of Huelva (Spain) (arantxavizcaino@gmail.com) (https://orcid.org/0000-0001-9399-2077)

Dr. Paloma Contreras-Pulido is Associate Professor in the Department of Education at the International University of La Rioja in Madrid (Spain) (paloma.contreras@unir.net) (https://orcid.org/0000-0002-6206-7820)

Dr. María-Dolores Guzmán-Franco is Professor in the Department of Pedagogy at the University of Huelva (Spain) (maria.guzman@dedu.uhu.es) (https://orcid.org/0000-0002-1170-3014)

ABSTRACT

The digital era has perpetuated new pedagogies of collective participation in networks that requires reflection in the conventional education area, because of YouTube, as audiovisual platform of outstanding international recognition, concentrates an extensive repertoire of informal learning practices among young people. In this case, the research focuses on a form of literary expression driven by the new Booktube community, which is dedicated to the recommendation of books and the promotion of reading by focusing their messages through the videoblog format. This aspect, closely popularized in the platform, allow us to deepen new youth practices outside classroom that refer to the promotion of books and critical and judicious expression on aspects related to content, formats, genres and authors in a context supported by the media ecology. In order to deepen the reasons why youth reads currently, we developed a literature review starting with the transmedia literacy concept evaluating narrative and aesthetic competences and applying a content analysis and a case study that collects channels of two Spanish booktubers with high impact and community: Javier Ruescas and Fly like a Butterfly. Results discern an affinity space linked to the opinion of peers that promotes reading and writing, and the ability to interpret, describe, compare and reflect about the literary context.

RESUMEN

La era digital ha perpetuado nuevas pedagogías de participación colectiva en red que requieren una reflexión en el área educativa, en tanto que YouTube, como plataforma audiovisual de sobresaliente reconocimiento, concentra un extenso repertorio de prácticas de aprendizaje informal y juvenil. En este caso, la investigación se centra en una forma de expresión literaria impulsada por la comunidad Booktube, que se dedica a la recomendación de libros y al fomento de la lectura focalizando sus mensajes a través del formato videoblog. Dicha vertiente, estrechamente popularizada en la plataforma, nos permite profundizar en nuevas prácticas juveniles fuera del aula que remiten a la promoción de libros y a la expresión crítica y juiciosa sobre aspectos relacionados con el contenido, los formatos, los géneros y los autores en un contexto auspiciado por la ecología mediática. Con el objetivo de profundizar en los motivos por los que la juventud lee actualmente, desarrollamos una revisión bibliográfica a partir del alfabetismo transmedia evaluando las competencias narrativas y estéticas, y aplicamos un análisis de contenidos mediante un estudio de caso que recoge los canales de dos booktubers españoles con amplia repercusión y comunidad: Javier Ruescas y Fly like a Butterfly. Los resultados atisban un espacio de afinidad ligado a la opinión entre pares que promueve la lectura y escritura, y a la capacidad para interpretar, describir, comparar y reflexionar sobre el contexto literario.

KEYWORDS | PALABRAS CLAVE

Transmedia literacy, YouTube, informal learning, media literacy, social networks, books, participative culture, young people.
Alfabetismo transmedia, YouTube, aprendizaje informal, competencias mediáticas, redes sociales, libros, cultura participativa, jóvenes.

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1. Introduction and state of the art

Cyberspace and the digital age have perpetuated new collective pedagogies constructed on the reorganization of social habits and customs in a collaborative economic context starred by the Internet, the connection between networks and resources, the interaction, openness and social inclusion. This environment has entailed globalization of user participation involving users who modify their condition to become coauthors and prosumers (producers and consumers) of new media and education products (Benassini-Felix, 2014; Scolari, 2016).

Delving into this reflection, the development of the Internet and digital communications enables the circulation of a wide diversity of contents through different media, which allows for the establishment of a hybrid pattern of vertical traffic (top-down and bottom-up), which works in a participatory and disorganized manner stemming from individual and common decisions (Islas, 2009; Jenkins, Ford & Green, 2015). These procedures reflect the visibility of new identities devoted to the creation, modification and cyclical redistribution of content that expand across participatory culture as a new scenario of media convergence (Jenkins, 2008).

This framework also relies on amateur and self- taught practices that unveil new communicational, social, and educational insights (Skripcova, 2017), breaking barriers in a civic, artistic, and creative expression: informal mentorship exercises based on the transmission of knowledge between peers. Thus, YouTube's celebrated reputation generates "a countless number of communities based on unlimited types of interests in which infinite forms of social relations develop" (Bautista-Sancho, 2012: 124). These are relationships and content that the Web 2.0 has amplified alongside people's skills, gradually incorporating these systems into everyday life.

Online communities have active agents (young people) that provide information and promote new channels of empowered and democratic communication (Arriaga, Marcellán-Baraze, & González-Vida, 2016; García-Galera, Fernández-Muñoz, & Del-Hoyo-Hurtado, 2017), these links evidence appropriation as a resource for collaborative learning and identity configuration (Ito & al., 2008; Livingstone, 2008). On these bases, the study aims to deepen the Booktube phenomenon on YouTube: a grouping of literary channels in which the self-proclaimed youtubers (booktubers) share tastes and interest for reading with their followers (Monteblanco, 2015). The final goal is, therefore, to inquire as to the motives for these relationships taking as a starting axis two celebrities from the Spanish speaking community: the readers and writers Javier Ruescas[1] and Fly like a Butterfly[2].

1.1. Cultural convergence on YouTube

Media convergence, in its globalizing process, has become reinforced by a constant evolution of the roles people play with and for the media, as well as for the cultural industry. In virtue of this scenario, the primitive conception assigned under the halo of passivity has transformed individuals into "active participants in the creation of new versions of history" (Miranda-Galbe & Figuero-Espadas, 2016: 121) that search for information, transmit concerns and produce stories. They configure an audience model that responds, according to García-Orosa (2018), to new traits including the explicit reception, the client-participant conversion, the inclusion of a cybermedia environment, and the integration and dissolution of the user in communities. In other words, "people make several active decisions when they share content" (Jenkins, 2008: 41) through digital media that manage the contemporary self with a breadth of informational, communicational and entertainment options. (Fernández-Rodríguez & Gutiérrez-Pequeño, 2017).

Active broadcasting audiences alter their participation and progress as creative audiences by going "beyond traditional consumption" (Scolari, 2013: 49), and unleashing a series of economic-cultural productions throughout history. These create new generations adapted to and associated with technology: the digital natives, the millennial generation, the gamer generation or the new millennium apprentices, who highlight the generational gaps in terms of technological and personal skills (Matamala-Riquelme, 2016), and who direct their interests towards innovative forms of creative and digital expression: blogging, microblogging or videoblogging.

This epitome of youth production and progression is accentuated with the arrival of YouTube in 2005 and its subsequent acquisition by the North American giant Google in 2006, placing the platform as the second website with the highest traffic worldwide (Alexa Traffic Statistics, 2018). A success that is not only reflected in the financial motivation of its users, youtubers (Lange, 2007) but also in the breadth of media content uploaded hour after hour and its mediation as a platform for personal expression (Scolari, 2018).

On YouTube young people disseminate ideas, beliefs, and customs through cultural hybridization and the struggle against homogeneity, in an affinity space that, as noted by Gee (2012), corresponds to that place or set of informal places where some people affiliate with others without sharing the same cultural, racial, ethnic characteristics. In

other words, they base their relationships on common activities, interests, and objectives. Several authors argue that the platform has become a stimulating resource that provides adequate safety for these users to promote opinions and encourage creativity from different perspectives, as well as to establish a parasocial interaction that reveals the inherent influence between them (Lee & Watkins, 2016). Here, youtubers, as trustworthy authorities (Pastor-Ruiz & Abarrou-Ben-Boubaker, 2018), pose relations of attraction with their followers on a physical, psychic, and homophilic level (attraction between homonyms in terms of their beliefs, tastes, etc.) (Rubin, Perse, & Powel, 1985; Eval & Rubin, 2003).

It is, therefore, a bargaining chip that links comments between peers; enhances social, emotional and cognitive skills (Tan & Pearce, 2011); and enables expression, informal learning and identity building. In a different realm, YouTube established itself as a source of entertainment and discussion, but also as a scenario of "archival capacities and social dynamics" that "have provoked the emergence of more proactive exercises" (Scolari, 2018: 95). This presents a vital starting point for video blogs (vlogs), network communication models that respond to a unique format: the asynchronous, multimodal monologue recorded in front of a camera that adapts and publishes on the web to a limited audience (Frobenius, 2014).

> The cases analyzed, although limited, show sufficient capacities in the interpretative, descriptive, comparative, reflexive and exploitable transmedia, where the last word is not only held by booktubers, but also by their followers. Thus, we begin the first contact in order to discover where the interest in books, reading, and youth writing arises from, which, first of all, seems to be associated with spatial affinity, and linked to a shared opinion between peers, public and social, crossing the borders of what is monomediatically pre-established.

1.2. Informal learning and transmedia literacy on Booktube

On the basis of this context, Jenkins (2006) conducted a study on new literacies (Area & Pessoa, 2012) more than a decade ago, involving both social and collaborative competencies, based on participatory culture and traditional and academic literacy. A notion that started from classical literacy: illiterate, literate, formal and linguistic; going through recognized media literacy: multimodal, consumer, critical and formal (Caldeiro-Pedreira & Aguaded-Gómez, 2017; Gutiérrez-Martín & Tyner, 2012); towards transmedia literacy: digital, multimodal, prosumer, critical and informal (Scolari, 2010). Namely, in this last point, transmedia literacy as a set of practices, relationships between media and youth, and informal learning strategies blurred by the online age (Gómez-Galán, 2017; González-Martínez, Serrat-Sellabona, Estebanell-Minguell, Rostan-Sánchez, & Esteban-Guitart, 2018). A concept based on daily activity and on unconsciously acquired, disorderly and casual instruction of knowledge, goes beyond media skills (Ferrés & Piscitelli, 2012), and displays a set of transmedia skills such as 1) learning by doing what you like; 2) learning by solving problems; 3) learning by imitation or simulation; 4) learning by examination or improvement of one's own or others' work; 5) and learning by means of teaching with the young person transmitting and receiving knowledge. Subsequently, Scolari (2018) defined YouTube as "a platform where transmedia competencies are being developed outside formal learning environments" (Scolari, 2018, p. 98). In fact, videos have become an educational resource for young people in terms of formal training and apprenticeship aimed at hobbies, as "eight out of ten use video for training purposes, a figure that reaches 96% and 94.6% in young people aged 14 to 19 and 20 to 24 respectively" (Fundación Telefónica, 2017: 152).

At this point, the report of the Spanish Reading and Book Observatory (2018), reveals reading as one of the favorite cultural practices in the country, growing to 3.5 points over the last four years. It represents a growing practice that shows the highest percentage of readers between the ages of 15 and 19 (90.1%). At the same time, the report on

Reading Habits and Book Purchase in Spain (Gremios de Editores de España, 2017), confirms the range of between 25 and 34 years (100%) followed by those between 14 and 24 (99.3%), indicating online sources as the main triggers.

Weeks, Ardèvol-Abreu and De-Zúñiga (2017) evidence, in this sense, that people increasingly depend on the influence of other individuals on social networks for recommendations, knowledge or opinions that affect their behavior and social dynamics. In other words, Lianaki-Dedouli and Plouin (2017) define it as learning to be and learning to live together. This is how opinion leaders can become sources of immeasurable influence within a mechanism of dependency and/or affinity (Gee, 2012), such that young people "demand reference points that enable them to find and select the most interesting titles" finding out "the opinions of their peers" (García-Rodríguez, 2013), this generates communities such as Booktube on YouTube. It is a "network comprised by users producing original content" who "use their own channels to celebrate or discuss books, generally fiction, dedicated to the adolescent public" (Sued, 2016).

The development of a reading habit is therefore closely linked to this literary event that surpasses the crossroads between traditional and digital reading. Some authors point to this community as a reading promotion phenomenon, of alliance with the publishing industry, and as a clear example of best practices for the development of a reading habit in the classroom (Rovira-Collado, Llorens-García, Fernández-Tarí, & Mendiola-Oñate, 2016; Rovira-Collado, 2016; 2017; Cortes-Vargas, 2018). Thus, a new informal learning strategy emerges, increasing transmedia competencies directly related to the literary universe and the growth of a critical and communicative spirit (Ballester & Ibarra, 2016).

2. Material and methods

Based on the literature review, the aim of this study is to investigate the factors that motivate young people to read through booktubers. That is, to initiate an exploration into the reasons why young people and young adults can read today. Similarly, we try to analyze those transmedia competencies derived from the narrative aspect of booktubers. The population selected using non-probability sampling includes the two channels belonging to eminent figures recognized in Spain, Javier Ruescas (250,988 followers), and Fly like a Butterfly (183.943 followers), a choice based on gender equity, the representativeness of two of the leading figures as reported by El País newspaper on August 13, 2017 (Filippi, 2017). Also, Spanish nationality and the number of subscribers were considered (YouTube awards a first silver prize to creators who exceed 100,000). Thus, we used a mixed methodology that includes qualitative and quantitative techniques: literary review, content analysis, and case study.

The analysis of contents, in this case, is established as a valid procedure for our study, recognized in the scientific-academic field as enabling documentary observation and, consequently, the manifestation of social events (Sierra-Bravo, 1994). Likewise, the technique uncovers a record of systematic and objective data, which, alongside the case study, namely research that involves a unit of analysis sample, is considered a replicable methodology for future research (Andréu-Abela, 2010; Hernández-Sampieri, Fernández-Collado, & Baptista-Lucio, 2007).

On this foundation, we designed the first evaluation instrument following Krippendorff´s (1997) guidelines, including sampling units (observable portions of reality) and recording units (delimitation and definition of units subject to the objectives of the study). With this approach, we proposed the categories (sampling units) and variables (recording units) in Table 1. These were extracted from reports on reading habits, and analyses on physical, psychic and homophilic attraction previously pointed out by Rubin, Perse, and Powell (1985), Turnet (1993) and Evan and Rubin (2003).

Next, we selected a reduced sample from both channels, which totaled 200 comments (100 comments from each of the videos sharing the same subject matter). This choice is justified, again, in the exploratory analysis and the first 100 comments that algorithmically in YouTube, are more relevant and display more interactions from the community (the platform gives primacy to those with more comments, likes, etc.). The content selected for the study, the Book Haul, is one of the most representative in the community, which deals with the recommendation of books purchased by booktubers. Therefore, with this first phase, we intend to explore some of the interests that promote reading and acquisition of books by young people based on the arguments and content shared by booktubers.

The next step, focused on the development of transmedia competencies through these practices, was to transcribe the statements of two booktubers applying as a second research instrument Scolari´s (2018)[3] narrative and aesthetic evaluation system, since it enables the interpretation of narratives: 1) appreciating aesthetic values; 2) recognizing genres, reconstructing narrative worlds and comparing stories; 3) expressing identities and visions of the world through narrative.

In order to do so, we used another sample consisting of the random (probabilistic) selection of videos visualized (374 from Javier Ruescas and 273 from Fly like a Butterfly), in order to unravel the degree of informal dexterity relative to the booktubers' abilities to interpret, recognize, describe, compare, evaluate, reflect and apply knowledge relating to narrative and literary aesthetics.

3. Analysis and results

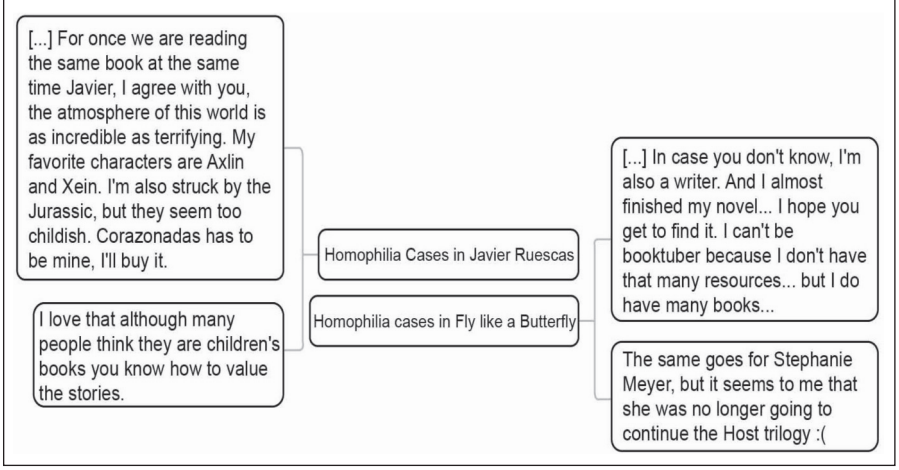
The questions raised in the methodological section were then approached by means of a content analysis that yielded the most important variables regarding the relationship between booktubers and followers. After applying the first research instrument, which gathered those recording units related to reading promotion, the acquisition of copies, and physical, psychic and homophilic attraction to the booktuber, a total of 200 comments were collected in an exclusive videoblog format, the Book Haul. In the case of the 100, Javier Ruescas' comments analyzed and specifically on the video "Book Haul: Laura Gallego, Blue Jeans, Josu Diamond, Andreo Rowling and more!" One can see that physical or psychological attraction are not priorities for the community of followers, as only 18% of them mention positive aspects linked to character or appearance. Along the same lines, on the video "Book Haul: Book Haul December 2016 and January 2017" by Fly like a Butterfly, only 6% of this physical-psychic interest is displayed. In other words, out of 200 comments, only 14% of subscribers refer to these particular traits. In contrast to the homophilia attraction by which users find a reason for spatial affinity with the booktuber (Gee, 2012), Javier Ruescas' channel contains a total of 80% of annotations linked to a shared passion for reading, authors, literary genres, etc. In Fly like a Butterfly, this trend is also preferential, as 68% refers to the same emotional, sentimental and personal relationship with the booktuber. Thus, presumably homophilia or spatial affinity, proposed by various authors, is one of the main reasons that invite a careful examination of this booktuber-follower relationship of reading affinity. Expressed quantitatively, out of the entire sample, 148 comments (74%) share some degree of affinity with youtuber[4], which represents an initial baseline to be delved.

Table 1. Categories and variables from the first sample

Intention to purchase	Whether or not it signals the future purchase/reading of the book.
Recommendations	They cite recommendations for books mentioned or others.
Physical/Psychic Attraction	Whether or not it refers to the physical/psychic attraction of the booktuber.
Homophilic Attraction	Whether or not it refers to homophilic aspects.
Homophilic Relationship	If the previous variable is positive, indicate homophilic relation.
Other	Comments that do not respond to the above variables.

Following the same design and taking into account purchase intention, acquisition, or book recommendations by followers on both channels, evidence suggests that, in the case of Javier Ruescas, this behavior is more prevalent than with Fly like a Butterfly. This matter represents a new investigative path for the evaluation of those characters that most influence the community of followers of each booktuber. In this case, Javier Ruescas' video focuses on the display of new additions to his bookshelf, arguing his choice, motivation, and interest in each book, yielding a total of 48% purchase intentions.

Figure 1. Example of homophilia comments in Javier Ruescas and Fly like a Butterfly



In the case of Fly like a Butterfly, however, the booktuber focuses the script on soliciting the opinion of its subscribers, eliciting the intention of purchase in only 28% of them. Overall, 76 comments (38%) focused on the will to buy or read, and 63 (31.5%) on the recommendation of new titles to peers or booktubers themselves. Given that Book Haul represents exclusive content to present acquired books, it would be interesting to broaden the spectrum to other audiovisual products, to find out the degree of interest within the community to acquire the books in a comparison that includes: book tags (sets of questions about books), wrap up (comments about books read), bookshelf tour (presentation of the personal library), unboxing (live opening of packages with books), etc.

Table 2. Examples of narrative and aesthetic skills in Javier Ruescas

Competencies	Specific competencies	Examples from Javier Ruescas
Interpret	Reconstruct transmedia narrative worlds.	[Ruescas] The first series I am going to tell you about is Sky's original and it is called Gomorrah, and is based on the novel by Roberto Saviano. [...] Another series that makes me mad and that I follow since it was released is The Strange, based on the book by Guillermo del Toro and Chuck Hogan... (https://bit.ly/2Eh31rq)
Recognize and describe	Genres in different media and platforms.	[Ruescas] This is science fiction, adventure and the characters each have their own personality, each has their own stories... (https://bit.ly/2QJ3tFJ)
Compare	To highlight the differences and similarities between different narrative worlds.	It had a plot very similar to the one we know from Cinderella. Moreover, since then many versions of this story have emerged in other cultures. Even our friend Jean Baptiste Basile [...] had his Cinderella story where the stepsisters, the little shoe, the transformations appeared... (https://bit.ly/2GbHmDz)
Evaluate and reflect	About a specific narrative world.	[Grooves] I love the metaphors he uses, I love the parallels he makes, I love how he describes love, music, art, magic, everything. In fact, the magic described in this book is beautiful, it is called sympathy, and it is a real wonder... (https://bit.ly/2Bb3Vmd)
Apply	Choose and consume/leave content based on aesthetic or narrative values.	[Ruescas] In my case, what weighs more right now than the cover itself is the name of the gentleman or the lady on it. That is, the author. For better or worse, the fact that one has read a book by that person can be decisive... (https://bit.ly/2RRZBPZ)
Examples of narrative and aesthetic skills in Fly like a Butterfly		
Competencies	**Specific competencies**	**Examples from Fly like a Butterfly**
Interpret	Understand the story, narration, etc.	[Esmeralda] For starters, there is the protagonist, who is a Colombian girl, who for her young age seems quite mature. One normal day he goes to her school, and suddenly they discover that there is a boy who has committed suicide... (https://bit.ly/2LeOVID)
Recognize and describe	Genres in different media and platforms.	[Esmeralda] There are from young children's to more adults, some classics, some totally juvenile and... because that is what I like, the variety... (https://bit.ly/2SIEZcO)
Compare	Highlight the differences and similarities between the different formats.	[Esmeralda] I have not followed her because it became too long and I started watching the TV series. [...] I like that in the television series they did not cut a hair like the author in the books... (https://bit.ly/2UESU5q)
Evaluate and reflect	Our own creations.	[Emerald] I had never written a book and much less proofread. The truth is that it is a process in which you have to remember everything you have done and then many parts that you have removed and then you do not remember, and you have to go back. The truth is that it was quite difficult, but also, when we read the final version we said: better, it is better this way... (https://bit.ly/2C7GZG7)
Apply	Choose and consume/leave content based on aesthetic or narrative values.	[Esmeralda] I am going to show you a couple that I have not read, but they have caught my attention, and I love the covers... (https://bit.ly/2RNVGUe)

Applying the second research instrument, adapted to Scolari's (2018) evaluation of narrative-aesthetic competencies, the aim was to explain the capacities and, consequently, transmedia skills unconsciously acquired by booktubers in informal learning environments. So, 1) the recognition of genres, formats, and reconstruction of narrative worlds; 2) the comparison of stories, genres, and formats; 3) and the expression of identities and worldviews through storytelling, awaken great skills and narrative mastery of this YouTube community. These cases are contemplated from the literal transcription of booktubers in a random selection of videos collected

in the form of an example in Table 2[5]. Interpreting, recognizing and describing, comparing, evaluating and reflecting, and applying narrative and aesthetic knowledge related to literature become latent informal transmedia competencies within the booktuber phenomenon, where the development of skills directly related to reading comprehension, evaluation, reflection, and communication are observed. Elements that, together with the figures presented, contribute to the achievement of the goal discussed below.

4. Discussion and conclusions

The Booktube community emerges as a manifestation of new informal online learning practices involving parasocial factors that determine the eminent development of transmedia skills outside the classroom (Lin & Farnham, 2013; Scolari, 2018). This is not only reflected in studies related to the educational community in its intervention for the promotion of literature and reading (Rovira-Collado & al., 2016; Rovira-Collado, 2016; 2017; Cortes-Vargas, 2018), but also in the link between booktuber and follower. In this study, we have been able to glimpse some of the reasons that invite young people's reading in a presumption environment such as YouTube.

In this way, the Booktube community displays glimpses of spatial affinity considerably related to the intercultural sharing of interest in books, authors and literary genres (Gee, 2012). Homophilia, then, seems to become one of the reasons for the growth of the Booktube community on knowledge, tastes, and literary preferences. A fact sustained prematurely on arguments, expositions and diverse contents that, in the same way, promote the automatic acquisition of abilities for the interpretation, reflection, evaluation, comparison, and reading-writing application.

In addition, it has been proven that both Javier Ruescas and Fly like a Butterfly are not only dedicated to the expression of opinions about literary products, but also to the production and promotion of their own copies. This note highlights the need to assess, from a widely expanded study population, whether this pattern of authorship is reiterated in order to delve into the community's level of narrative and aesthetic competence, as well as the writing aspiration of its followers.

It should be emphasized that, unlike other studies on the identity and autobiographical fame of youtubers (Pérez-Torres & al., 2018), booktubing has created a synergy of collaboration, recommendation, and participation among equals in which the physical or psychic aspects are not as important as tastes and reflections. This inference invites the replication of the study in a larger community and a subsequent geographical comparison of tastes and knowledge in different cultural spaces. For all these reasons, the urge to buy, give and read books in libraries is introduced into these processes as a mere sequel to the evaluation and expression of knowledge related to literature.

This event of increasing significance for the educational field which, from transmedia literacy and new youth practices in social networks, finds new literary development tactics in environments that are beyond academic control, but which, similarly, are positive and relevant for in-class analysis.

The cases analyzed, although limited, show sufficient capacities in the interpretative, descriptive, comparative, reflexive and exploitable transmedia, where the last word is not only held by booktubers, but also by their followers. Thus, we begin the first contact in order to discover where the interest in books, reading, and youth writing arises from, which, first of all, seems to be associated with spatial affinity, and linked to a shared opinion between peers, public and social, crossing the borders of what is monomediatically pre-established (Frobenius, 2014; Scolari, 2018). Although this research may reflect a sample limitation confined to the success of two Spanish-speaking case studies, we insist on exhaustively deepening the relationships that motivate youthful reading through the booktubing phenomenon. To this end, we invite the development of a more comprehensive, comparative and conclusive examination. Thus, this study offers the methodological bases and unveils the need to address the influence exerted by different booktubers on young people through their contents and reasoning. Along the same lines, it facilitates confirmation and reflection on the factor of peer affinity as an eminent motivational force for reading in quotidian and informal environments.

Notes

[1] Watch Javier Ruescas channel (https://bit.ly/1IDc9AP).

[2] Watch Fly like a Butterfly channel (https://bit.ly/2eVeMr1).

[3] See appendix and Scolari's (2018) instrument to record narrative and aesthetic competencies and its methodological application (https://doi.org/10.6084/m9.figshare.6225044).

[4] See the complete appendix on the physical/psychic and homophilic attraction records, as well as the purchase intention and recommendations (https://doi.org/10.6084/m9.figshare.6225602).

[5] See Table 1 in full (https://doi.org/10.6084/m9.figshare.6225608).

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References

Andréu-Abela, J. (2000). Las técnicas de análisis de contenido: una revisión actualizada. *Fundación Centro Estudios Andaluces*, *10*(2), 1-34. https://bit.ly/2PL0kkW

Alexa Traffic Statistics (Ed.) (2018). *How popular is youtube.com?* https://bit.ly/2BAYz2h

Area, M., & Pessoa, T. (2012). De lo sólido a lo líquido: las nuevas alfabetizaciones ante los cambios culturales de la Web 2.0. [From solid to liquid: New Literacies to the cultural changes of Web 2.0]. *Comunicar*, *38*(XIX), 13-20. https://doi.org/10.3916/C38-2012-02-01

Arriaga, A., Marcellán-Baraze, I., & González-Vida, M. (2016). Las redes sociales: espacios de participación y aprendizaje para la producción de imágenes digitales de los jóvenes. *Estudios sobre Educación*, *30*, 197-216. https://doi.org/10.15581/004.30.197-216

Bautista-Sancho, L. (2012). Los cambios en la web 2.0: una nueva sociabilidad. *Estudios sobre el Mensaje Periodístico*, *18*, 121-128. https://doi.org/10.5209/rev_ESMP.2012.v18.40917

Ballester, J., & Ibarra, N. (2016). La educación lectora, literaria y el libro en la era digital. *Revista Chilena de Literatura*, *94*, 147-171. https://doi.org/10.4067/S0718-22952016000300008

Benassini-Felix, C. (2014). De audiencias a prosumidores. Acercamiento conceptual. *Luciérnaga Comunicación*, *6*(12), 16-29. https://bit.ly/2zBotV6

Bhatia, A. (2018). Interdiscursive performance in digital professions: The case of YouTube tutorials. *Journal of Pragmatics*, *124*, 106-120. https://doi.org/10.1016/j.pragma.2017.11.001

Caldeiro-Pedreira, M., & Aguaded, I. (2017). Contenido e interactividad. ¿Quién enseña y quién en la realidad digital inmediata? *Virtualidad, Educación y Ciencia*, *8*(15), 95-105. https://bit.ly/2SjENk0

Cortes-Vargas, F. (2018). *El fenómeno Booktuber y los nuevos tipos de lecturas que se están promocionando* (Tesis de maestría). Universidad Distrital Francisco José de Caldas, Bogotá.

Del-Fresno-García, M. (2011). Infosociabilidad: Monitorización e investigación en la web 2.0 para la toma de decisiones. *El Profesional de la Información*, *20*(5), 548-554. https://doi.org/10.3145/epi.2011.sep.09

Eyal, K., & Rubin, A. (2003). Viewer aggression and homophily, identification, and parasocial relationships with television characters. *Journal of Broadcasting & Electronic Media*, *47*(1), 77-98. https://doi.org/10.1207/s15506878jobem4701_5

Fernández-Rodríguez, E., & Gutiérrez-Pequeño, J. (2017). La socialización de los jóvenes interconectados: experimentado la identidad en la sociedad aumentada. *Profesorado*, *21*(2), 171-190. https://bit.ly/2RtBwPj

Ferrés, J., & Piscitelli, A. (2012). La competencia mediática: Propuesta articulada de dimensiones e indicadores. [Media competence. Articulated proposal of dimensions and indicators]. *Comunicar*, *38*(XIX), 75-82. https://doi.org/10.3916/C38-2012-02-08

Filippi, A. (2017). Booktubers: Cuando lo que recomienda tu youtuber favorito son libros. *El País*. https://bit.ly/2w2RIQo

Frobenius, M. (2014). Audience design in monologues: How vloggers involve their viewers. *Journal of Pragmatics*, *72*, 59-72. https://doi.org/10.1016/j.pragma.2014.02.008

Fundación Telefónica (Ed.) (2017). *Sociedad digital en España*, *2017*. Madrid: Ariel. https://bit.ly/2lOc7RH

García-Galera, M., Fernández-Muñoz, C., & Del Hoyo-Hurtado, M. (2017). Ciudadanía informada, ciudadanía participativa. La movilización de los jóvenes en el entorno digital. *Prisma Social*, *18*, 124-143. https://bit.ly/2E0E2ZB

García-Orosa, B. (2018). Perfil de la audiencia de cibermedios: Representación discursiva y praxis del receptor 2.0. *Palabra Clave*, *21*(1), 111-133. https://doi.org/10.5294/pacla.2018.21.1.6

Gee, J. (2012). Nurturing affinity spaces and game-based learning. En Constance S., Kurt, S., & Sasha, B. (Eds.), *Games, learning and society: learning and meaning in the digital age* (pp. 129-155). Cambridge: Cambridge University Press. https://doi.org/10.1017/cbo9781139031127.015

Gómez-Galán, J. (2017). Nuevos estilos de enseñanza en la era de la convergencia tecno-mediática: hacia una educación holística e integral. *International Journal of Educational Research and Innovation*, *8*, 60-78. https://bit.ly/2PeTkfc

González-Martínez, J., Serrat-Sellabona, E., Estebanell-Minguell, M., Rostan-Sánchez, C., & Esteban-Guitart, M. (2018). Sobre el concepto de alfabetización transmedia en el ámbito educativo. Una revisión de la literatura. *Comunicación y Sociedad*, *33*, 15-40. https://doi.org/10.32870/cys.v0i33.7029

Gremios de Editores de España (Ed.) (2017). *Hábitos de lectura y compra de libros en España*, *2017*. Madrid: Conecta.

Gutiérrez-Martín, A., & Tyner, K. (2012). Educación para los medios, alfabetización mediática y competencia digital. [Media education, media literacy and digital competence]. *Comunicar*, *38*(XIX), 31-39. https://doi.org/10.3916/C38-2012-02-03

Hernández-Sampieri, R., Fernández-Collado, C., & Baptista-Lucio, P. (2007). Selección de la muestra. In *Fundamentos de metodología de la investigación* (pp. 169-173). Madrid: McGraw Hill.

Islas, O. (2009). La convergencia cultural a través de la ecología de medios. [Understanding cultural convergence through Media Ecology]. *Comunicar*, *33*(XVII), 25-33. https://doi.org/10.3916/c33-2009-02-002

Ito, M., Horst, H., Bittanti, M., Boyd, D., Stephenson, B., Lange, P., & al. (2008). *Living and learning with New Media: Summary of findings from the Digital Youth Project*. Chicago: The MacArthur Foundation. https://doi.org/10.7551/mitpress/8519.001.0001

Jenkins, H. (2006). *Confronting the challenges of participatory culture: Media education for the 21st century*. Chicago: MacArthur Foundation. https://doi.org/10.7551/mitpress/8435.001.0001
Jenkins, H. (2008). *Convergence culture: La cultura de la convergencia de los medios de comunicación*. Barcelona: Paidós.
Jenkins, H. (2009). *Fans, blogueros y videojuegos: La cultura de la colaboración*. Barcelona: Paidós.
Jenkins, H., Ford, S., & Green, J. (2015). *Cultura transmedia: La creación de contenido de valor en una cultura en Red*. Barcelona: Gedisa.
Krippendorff, K. (1997). *Metodología de análisis de contenido: Teoría y práctica*. Barcelona: Paidós.
Lee, J., & Watkins, B. (2016). YouTube vloggers influence on consumer luxury brand perceptions and intentions. *Journal of Business Research*, *69*, 5753-5760. https://doi.org/10.1016/j.jbusres.2016.04.171
Lilianaki-Dedouli, I., & Plouin, J. (2017). Bridging anticipation skills and intercultural competences as a means to reinforce the capacity of global citizens for learning to learn together. *Futures*, *94*, 45-58. https://doi.org/10.1016/j.futures.2017.03.001
Livingstone, S. (2008). Taking risky opportunities in youthful content creation: Teenagers use of social networking sites for intimacy, privacy and self-expression. *New Media & Society*, *10*, 393-411. https://doi.org/10.1177/1461444808089415
Miranda-Galbe, J., & Figuero-Espadas, J. (2016). El rol del prosumidor en la expansión narrativa transmedia de las historias de ficción en televisión: El caso de El Ministerio del Tiempo. *Index Comunicación*, *6*(2), 115-134. https://bit.ly/29WSp4m
Monteblanco, L. (2015). Comunidades en red en la Sociedad de la Información: informan, comunican, conectan. El fenómeno Booktube. *Informatio*, *20*(1), 49-63. https://bit.ly/2AGzUdL
Observatorio de la Lectura y el Libro de España (Ed.) (2018). *El sector del libro en España*. Madrid: Secretaría General Técnica.
Pérez-Torres, V., Pastor-Ruiz, Y., & Abarrou-Ben-Boubaker, S. (2018). Los youtubers y la construcción de la identidad adolescente. [YouTuber videos and the construction of adolescent identity]. *Comunicar*, *55*(XXVI), 61-70. https://doi.org/10.3916/C55-2018-06
Raun, T. (2015). Video blogging as a vehicle of transformation: Exploring the intersection between trans identity and information techonology. *International Journal of Cultural Studies*, *18*(3), 365-378. https://doi.org/10.1177/1367877913513696
Rovira-Collado, J. (2016). Del blog de LIJ 2.0 al booktuber en la promoción del hábito lector. *RESED*, *4*, 37-51. https://bit.ly/2Qa8NT2
Rovira-Collado, J., Llorens-García, S., Fernández-Tarí, S., & Mendiola-Oñate, P. (2016). Nuevas perspectivas en la didáctica de la literatura infantil y juvenil: booktuber y booktrailer. In R. Roig-Vila, J. Blasco-Mira, A. Lledó-Carreres, & N. Pellín-Buades (Eds.), *Investigación e innovación educativa en docencia universitaria. Retos, propuestas y acciones* (pp. 1755-1771). Alicante: Universidad de Alicante.
Rovira-Collado, J. (2017). Booktrailer y Booktuber como herramientas LIJ 2.0 para el desarrollo del hábito lector. *Investigaciones sobre Lectura*, *7*, 55-72. https://bit.ly/2G6xcEz
Rubin, A., Perse, E., & Powell, R. (1985). Loneliness, para-social interaction, and local television news viewing. *Human Communication Research*, *12*(2), 155-180. https://doi.org/10.1111/j.1468-2958.1985.tb00071.x
Scolari, C. (2010). *Convergencia, medios y educación*. Santiago de Chile: Relpe.
Scolari, C. (2013). *Narrativas transmedia. Cuando todos los medios cuentan*. Barcelona: Deusto.
Scolari, C. (2016). Alfabetismo transmedia. Estrategias de aprendizaje informal y competencias mediáticas en la nueva ecología de la comunicación. *Telos*, *13*, 1-9. https://bit.ly/2aoH5Zs
Scolari, C. (2018). *Adolescentes, medios de comunicación y culturas colaborativas. Aprovechando las competencias transmedia de los jóvenes en el aula*. Barcelona: Ce.Ge.
Sierra-Bravo, R. (1994). *Técnicas de investigación social: Teoría y ejercicios*. Madrid: Paraninfo.
Skripcova, L. (2017). Participative culture in community media. *European Journal of Media, Art & Photography*, *5*(1), 98-100. https://bit.ly/2DVTLZD
Sued, G. (2016). Formas distantes de ver YouTube: Una exploración por la comunidad Booktube. *Virtualis*, *7*(14), 91-111. https://bit.ly/2AHexsM
Tan, E., & Pierce, N. (2011). Open education videos in the classroom: exploring the opportunities and barrier to the use of YouTube in teaching introductory sociology. *Research in Learning Technology*, *19*, 125-132. https://doi.org/10.3402/rlt.v19s1/7783
Weeks, B., Ardèvol-Abreu, A., & Gil-de-Zúñiga, H. (2017). Online influence? Social Media use, opinion, leadership, and political persuasion. *International Journal of Public Opinion Research*, *29*(2), 214-239. https://doi.org/10.1093/ijpor/edv050

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From media planner to media expert: The digital effect in advertising

Del planificador de medios al experto en medios: El efecto digital en la publicidad

Dr. Marta Perlado-Lamo-de-Espinosa is Full Professor in the Department of Advertising at the Antonio de Nebrija University (Spain) (mperlado@nebrija.es) (https://orcid.org/0000-0002-7476-0809)

Dr. Natalia Papí-Gálvez is Professor in the Department of Communication and Social Psychology at the University of Alicante (España) (natalia.p@ua.es) (https://orcid.org/0000-0002-4871-1691)

Dr. María Bergaz-Portolés is Assistant Professor in the Department of Advertising at the Antonio de Nebrija University (Spain) (mbergaz@nebrija.es) (https://orcid.org/0000-0001-7945-3464)

ABSTRACT

The increase in online audience and the development of Big Data in organizations modify the media planning activity and, consequently, the profile of the planner. Following the digital expansion, more information has become available to perform this task, but also, more complexity is observed in the work processes and in their agents' structures. This paper analyzes the changes produced in the management of the media planner within the digital society. Through triangular research, comprising quantitative and qualitative methods, including a questionnaire that was administered to 140 media planners, and 5 interviews conducted with agency experts we examine the variations that have occurred in this professional role in terms of knowledge, the tools used and the skills they have had to maintain or update. It is noted that the adaptation to the digital context has required a substantial change in their work mechanics, the integration of off- and online strategies and digital specialization. Furthermore, with the help of current technology, immediate actions and reviews are implemented. Consequently, the media expert activity requires mastery of digital media planning tools, greater doses of innovation, analysis, business acumen and the ability to work effectively in multidisciplinary teams for multimedia environments.

RESUMEN

El incremento de la audiencia «online» y el desarrollo del «big data» en las organizaciones modifican la actividad de la planificación de medios y, en consecuencia, el perfil del planificador. Tras el avance digital se dispone de mayor información para ejercer esta labor, pero, igualmente, se observa más complejidad en los procesos de trabajo y en las estructuras de sus agentes. Este trabajo analiza los cambios producidos en la gestión del planificador de medios en la sociedad digital. A través de una investigación triangular que incluye métodos cuantitativos y cualitativos, donde se utiliza un cuestionario aplicado a 140 planificadores de medios y la realización de 5 entrevistas a expertos de agencias, se examinan qué variaciones se han producido en este rol profesional respecto a los conocimientos, herramientas utilizadas y competencias que han tenido que mantener o actualizar. Se constata que la adaptación al contexto digital supone un cambio sustancial en las mecánicas de trabajo, la integración de estrategias «off» y «online» y la especialización en digital. Asimismo, con la ayuda de la tecnología vigente, se implementan acciones y revisiones inmediatas. En consecuencia, la actividad del experto en medios exige el dominio de herramientas de planificación de medios digitales, mayores dosis de innovación, análisis, visión comercial y trabajar eficazmente en equipos multidisciplinares para entornos multimedia.

KEYWORDS | PALABRAS CLAVE

Media planner, Internet, online audiences, big data, digital media, skills, advertising agencies, advertising.Planificador de medios, Internet, audiencias online, big data, medios digitales, competencias, agencias de medios, publicidad.

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1. Introduction

Most authors agree that, with the deployment of technology, the arrival of the Internet and the consequent digitalization, the media ecosystem has been transformed in such a way that it will never again be the same (Livingstone, 1999; Salaverría & García-Avilés, 2008; Van-der-duff, 2008; Flores-Vivar, 2009; Cabrera, 2011; Cardoso, 2011; Martín-Guart & Fernández-Cavia, 2012; Perlado, 2013). In just over 20 years, the growth of the Internet in terms of audience penetration has gone from 1% (1996) to 75.7% (2017), occupying third place behind Television and Outdoor Advertising (AIMC, 2018) and second place in terms of advertising investment (Infoadex, 2018). At the same time, the arrival of the Internet involves disruptive innovation processes (Christensen, 2014) whereby new markets and values are established.

According to the global forecast, online content consumption will continue to grow. In "The State of Digital" (GroupM, 2018) it was announced that in 2018 the time dedicated to online media would exceed the time devoted to online television for the first time.

Furthermore, Zenith Media (2018) notes that the total investment in mobile advertising will grow annually by 19% until 2020, a figure that will represent over half of the online advertising investment and 29% of the entire advertising revenue. In turn, Advanced Television (US: Smartphone time to overtake TV in 2019, 2018), stresses that the combined advertising investment in desktop computers and mobile phones already exceeds the investment in television; although, some trends point to a decline in the use of smartphones due to the use of other more recent devices, such as smart speakers, portable accessories and augmented/virtual reality (AR/VR) headsets.

In television, audiences are declining, especially among young people, some of whom do not even have a traditional television set (Maheshwari & Koblin, 2018). In order to watch audiovisual content, they use an endless number of devices and applications, and everyday mobile SVOD (Subscription Video on Demand) services increase, which competes with traditional television. Indeed, for millennials, social networks have an enormous influence on their buying decisions, and many of them acquire fashion and beauty products, among other things, influenced by Instagram, giving great importance to the recommendations made by friends and influencers in these media (Pérez-Curiel & Luque, 2017).

Thus, the digital environment makes it possible to interact and innovate with new strategies not only to support the brand through advertising but also to prescribe it to other users in the networks (Del-Pino & Galán, 2010). In this sense, the social media audience ranking is published every year, and its growth continues to be remarkable. Four platforms have an audience of more than a billion users (Facebook, Twitter, Youtube, and LinkedIn) and Instagram will soon become the fifth (We are Social & Hootsuite, 2018).

At the same time, the huge supply of access to information and entertainment diversifies online audiences and leads to small segmentations (López-Vidales, 2005), opening increasingly more communicative options and imposing personalization and hyper-targeting (Ros, 2008), driven by growing information about the audience.

Technology developers and webcasting platforms enable the management of big data in order to get to know the audiences better and to optimize their content and marketing (Kantar Media, 2017; Canada Media Fund, 2018).

Consequently, changing media exposure and the technological drive stimulate reforms in all advertising communications (Schultz, 2016; Kuman & Gupta, 2016) and necessarily in the professional area that relates more closely to the media and their audiences; that of media planning.

This activity consists of a strategic decision-making process in which media formats are evaluated and selected to achieve the objectives of the advertising campaign most profitably and effectively possible (Perlado-Lamo-de-Espinosa, 2006; Papí-Gálvez, 2017), although this discipline has evolved parallel to the common mutations of the field.

The media have been losing their primary characteristics, becoming content containers (Soengas, 2013), which have affected the drafting of the media plan, which has been transformed into a global communication solution integrating traditional and online media.

The focus of campaigns according to attitudinal variables of the target audience is also a usual request among researchers and professionals (Beales, 2010, Benavides, Villagra, Alameda, & Fernández, 2010; Katz, 2017).

Moreover, agencies have had to adapt to the arrival of new actors such as intermediaries between advertisers or agencies and media (Demand Side Platform: DSP), virtual buying/selling platforms for advertising spaces (Ad exchange), advertising networks, technological platforms for result optimization in the sale of advertising space (Supply Side Platform: SSP) and data suppliers, among others (IAB Spain, 2014).

Technology defines the current profiles, and professional roles (López-García, Rodriguez-Vázquez & Pereira-

Fariña, 2017; Sánchez-Sánchez & Fernández-Cavia, 2018; IAB Spain 2018) and media planners also have to conform to the parameters of the new communication model. This profile, characterized by expertise in communication media, with analytical abilities to interpret marketing and communication problems, creative aptitudes, strategic vision, market research knowledge, as well as certain attributes for presentation, argumentation and staging (González-Lobo & Carrero-López, 1999; Sissors & Baron, 2010), has had to take on the mastery of the broad universe represented by the Internet; a liquid media without barriers or borders, meta-media, as Solana (2010) describes it, that matches consumption and multi-device exposure, adjusted audience measurement systems and new integration, negotiation and buying processes.

The change is such that foreseeably this professional not only has to increase his/her knowledge of digital deployment but also of tools and the acquisition of different skills to adapt to the current strategic planning model, taking on more strategic tasks and incorporating more skills regarding research and web analytics (Papí-Gálvez, 2014).

In light of the communicational and technological challenges described, in general, this study intends to find out whether the digital media have substantially modified the advertising media planning activity as well as the skills linked to the related professional profile. In particular, the study poses the following three objectives:

> The digital and technological deployment acts, in a broad sense, on the ordinary work processes of the media planner and, in particular, on the new management of audience data, the purchase of spaces and the ability to make decisions in real time.

O1) To identify the main changes that have taken place in recent years (2000-2015) as a result of the digital media, especially regarding media planning in advertising; in the mechanics of work, techniques and roles.

O2) To delve into the knowledge, tools and transversal skills that are considered necessary for media planners in the digital society.

O3) To explore the adaptation of these professionals for the purpose of digital communication according to their professional careers, distinguishing intervals between 3 to 5 years of experience, 6 to 10, 11 to 20 and more than 20 years working in the sector.

2. Material and methods

Methodological triangulation was used, combining questionnaires, as a quantitative technique, and open interviews with experts, as a qualitative one. The survey showed which basic aspects of media planners' activity and their profiles had been affected by the digital deployment. In the open interviews, questions were asked about the changes produced in commercial communications and in the area of media planning, going into depth on the techniques, processes, and skills of the planner's profile.

The State Collective Bargaining Convention for Advertising Companies defines the media planner as "the person who establishes the media strategy to be used in the campaigns, according to the planned objectives and according to their profitability, coverage and client's budget" (Spanish Ministry of Employment and Social Security, 2016: 10487). Additionally, this convention includes other profiles related to media such as that of the media director/strategic media planner, planning manager, head of media buying or media buyer. In this research, the generic term "media planner" was used as an umbrella term for all the cited profiles.

2.1. Questionnaire

The universe was defined as media planners working in the Autonomous Community of Madrid and who have at least three years of experience in media agencies.

In the absence of an official registration for these professionals, the Economically Active Population Survey (EAPS) of the National Statistics Institute (INE) was used to quantify them[1], as well as the study "Radiografía de la

Industria Publicitaria" (X-ray of the Advertising Industry) (2009) by the General Association of Advertising Companies (AGEP) and the National Federation of Advertising Companies (FNEP)[2], and the report by the Observatorio de la Publicidad (Advertising Observatory) (2016). The analysis "Best Place to Work" by Scopen (2015) was also used, in which it was stated that 44.8% of the 427 interviews conducted with professionals were planners (Scopen, 2015).

The agencies themselves were consulted to learn the percentage of planners in their organizations[3], obtaining an average of 37.8%. It was determined that 41% of media agency workers in Spain could be planners, which represented 6,519 professionals. As 37.9% of the advertising companies were located in the Autonomous Community of Madrid (AGEP, 2009), this yielded a total of 2,471 professionals.

Applying the minimum age filter of 25 and 26 years, the universe was set at 2,372 planners in this Autonomous Community with a minimum of three years of experience in the sector. In order to determine the sample, standard social research criteria were used (Figure 1).

The semi-structured questionnaire was self-administered online. In order to send it, a specialized digital platform was chosen, and email was used for its dissemination, aided by the previous contact by the researchers through snowball sampling. The fieldwork for the questionnaire was carried out between November 2016 and January 2017.

The response rate was 42%, with 167 responses to the questionnaire. From these, 140 were used as valid; a representative sample of the universe assuming a final margin of error of 8%.

Figure 1. Questionnaire sheet

The questionnaire began with personal identification questions: sex, age, years of experience as a planner, a position held, professional tasks within the organization and the agency where he/she carries out his/her work. The following questions were aimed at the changes in the design and the formulation of the strategy and the media plan resulting from the emergence of digital media. It also deepened the planners' belief about the transformation of his profile after the technological development and expansion of the Internet. The questionnaire also included changes in knowledge, tools and transversal skills.

2.2. Interviews with experts

A non-probabilistic convenience sampling technique was applied. Within the profile of the universe defined for the study, professionals with a work environment in both traditional and digital areas were sought in order to observe their approach according to this typology. Furthermore, professionals holding different positions were selected from different agencies, with a minimum experience of ten years and a vision for analyzing the evolution in the processes and skills.

In accordance with the purpose of qualitative techniques, the theoretical significance of the sample was sought through the selection of relevant traits among the professionals, which are guarantors of an adequate formulation of questionnaire items and which facilitated the explanation of the descriptive and quantitative data.

Five experts were interviewed (Table 1). The first four interviews were conducted during the month of October 2016 and the last one was carried out in June 2018, with the aim of verifying that the results were up to date.

3. Analysis and results

3.1. Changes in the processes: the activity

Almost all respondents said their work had changed since the digital deployment (94%). This transformation had been experienced in most stages of the planning process, but mainly in the definition of milestones and target audience, selection and recommendation of media/supports, purchase, monitoring and evaluation of the campaign, the latter aspect being where the greatest variation was perceived.

In relation to the knowledge acquired or updated for their usual work, those derived from new work processes (82%) and web analytics (73%) stood out. Respondents mentioned knowledge about media and audience studies to a lesser extent.

The in-depth interviews revealed the importance of transformations in work mechanics, in addition to data

capture and management; both aspects closely linked to the commitment to a better integration of media in strategies, accompanied by a greater specialization in digital communication: "There has been an important change: first, with the emergence of the technology layer, and second, the data layer. This has altered the processes significantly" (Herrero). "There are indeed specialists in each medium, there are specialists in digital, but that person also sees the whole. There is increasingly more specialization (...). Now there are five or six digital disciplines, but everything is integrated within the same team" (Díaz).

Table 1. Experts interviewed

Experts	Environment	Experience	Position	Company
Mr. Juan Antonio Díaz	Offline	16 years	Dir. Customer Services	Universal McCann
Mr. Alejandro Estévez	Offline & online	12 years	Managing Director	Wink
Ms. Leticia Herrero	Online	14 years	Head of Digital	Forward
Ms. Fuensanta Pérez	Offline	13 years	Account Manager	Havas Media
Ms. María Castellanos	Research	12 years	Head of DAN Data Companies Integration	Dentsu Aegis Network

Another important change was the immediacy of the Internet and technological development that enables action implementation in real time so that the timing of the processes is reduced, and as soon as information related to results is received, changes can be made:

"You are able to make campaign decisions, I will not say every minute, but indeed every day (…). We are in a business that seems more like a stock market trading business of operating campaigns than buying or intermediating media (…). From the monitoring viewpoint, I believe that we have advanced considerably. Going back to the way a campaign was traditionally done in Excel (and sending it), today there are tools like Datorama, which is a dashboard model in which you are able to integrate that set of things" (Estévez). "Now one learns about what is working and, in real time, changes are made to the same plan" (Díaz).

According to the respondents, with the emergence of a greater number of actors, processes become more complex. Also, the digital boost leads to the development of new techniques used as part of the planning activity, such as programmatic buying, which experts agreed was revolutionizing digital media. In particular, they noted that it affected the online medium in the purely tactical process of purchasing within planning: "Programmatic buying has changed a lot in digital planning, more than in other media (...) because it is a more efficient way to optimize coverage" (Pérez).

In the work process, there is still a need to focus on the effectiveness and efficiency of the actions to be performed. Without losing sight of the results, big data management is presented as one of the critical aspects for econometric models, central to decision-making. This management contributes to more audience-oriented planning: "The top advertisers have their own econometric models; in the end what they do is try to anticipate knowing what works best to generate sales" (Díaz). "The data allows you to obtain a lot of information in order to make models and analyses to elicit business 'learnings'" (Pérez). "What you do in the 'data lake' is structure it, in some way clean it and extract information to create qualified audiences, in order to activate them through the DMP[4] in different legs of communication" (Castellanos).

3.2. Skills and specific abilities: the professionals

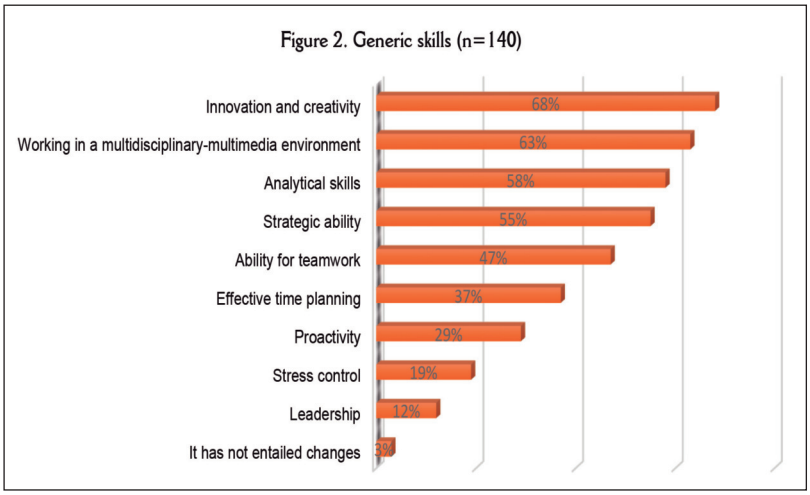
With regard to skills related to the mastery of tools, respondents stressed the need for better management of programs specific to digital media planning (77%). In addition, nearly half stated that data exploitation software for market studies have greater importance in the digital environment. They emphasized the use of tools to improve data analysis, visualize results or as support in the presentation of campaigns. Some examples are the Data Management Platforms that allow classification or segmentation (creation of clusters) and can facilitate the application of allocation models.

Regarding the generic skills, respondents stressed innovation capacity and the need to adapt media function to a more multidisciplinary and multimedia framework, typical of the global and digital environment (Figure 2). Within client service teams there are specialists from different disciplines of digital communication (SEO, SEM, mobile...), as well as more statistical or mathematical profiles, responsible for the data sector. Multidisciplinarity is a relevant aspect that the experts also explained during the interviews:

"We all have to become multidisciplinary, with respect to understanding and knowing how to manage different disciplines (...). The specialists in each medium are necessary, but from the brand viewpoint, it does not make sense to parcel out the recommendations, the vision, or the approach" (Herrero).

"Being multidisciplinary takes on much more relevance now, in the sense of understanding that there are people with very different training when producing a global strategy that has (...) different cases: special actions in television, special activation that unites television, radio and digital... The greater the multidisciplinary training of people, the richer the strategies and the activations that are produced (...)" (Díaz).

In addition, both survey respondents and experts insisted on the indispensable inclusion of analytical and strategic profiles, in addition to the ability to provide solutions tailored to the client's objectives: "An analytical or technology profile, that has that customer service part" (Herrero). "People who have good analytical skills (...). In addition to mathematics, I would like to find those analytical profiles with the capacity to understand the business and the customers, and who are able to transform all that knowledge into something understandable, by agency teams and by customers" (Castellanos).



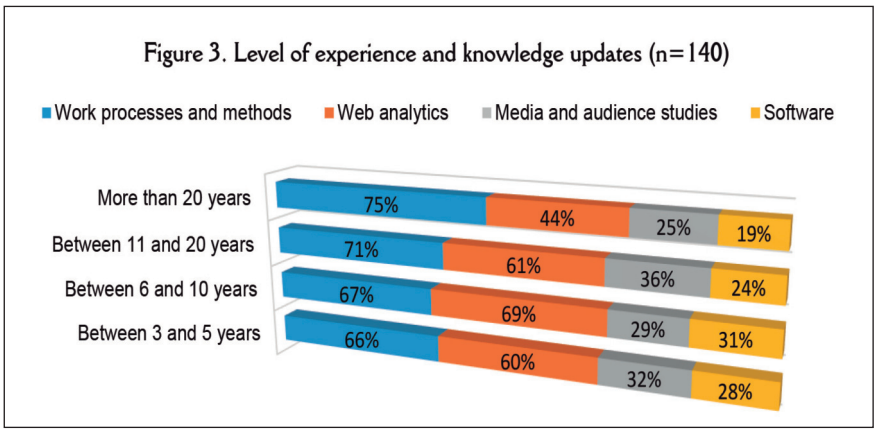
Pursuant to this last statement, other experts highlighted the lack of experience of the more technical professionals in dealing with the client; although they grow rapidly in their area and professional career, they do not seem to develop a strategic approach linked to commercial objectives at the same pace. However, it would be possible to provide these professionals with specialized business training.

3.3. Disruption and professional experience

The analysis of changes produced in the planners' profile in relation to their experience showed that the longer the career in the sector, the higher the need for broadening or updating knowledge on new processes and work methodologies.

A priority need for all the ranks studied is the need to increase web analytics knowledge, with little difference when compared to concerns about processes and working methods.

In particular, the experts also stressed the areas of analytics and programmatic advertising as specific knowledge that they must broaden as a result of the digital media: "Although I began in digital, I have changed; the entire subject of programmatic advertising and analytics reached me when I had some years of experience, when you believe you have already learned" (Herrero). "I always talk about performance and programmatic buying, which are quite technical areas, because nowadays there is a great tendency to look for this type of strategy and it seems that it has a technical part that you have to know. I have a lot to learn there". (Perez)



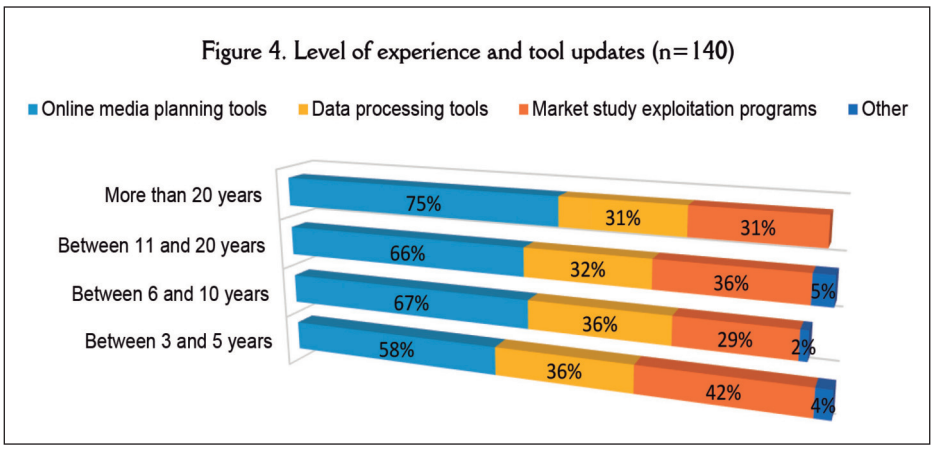
Mastery of media planning tools is the most relevant specific area at all

levels of practice. The greater the experience, the greater the need to manage new software related to marketing intelligence technologies (Figure 4): "for them to know other types of technologies which is what we have today, all the Salesforce environments, Adobe..". (Castellanos).

Market study exploitation programs concerned the more junior planners, with a maximum of five years of experience, since this is when they learn to manage them.

In relation to personal skills, those professionals with a longer career track display a higher level of concern regarding the adaptation to new work processes and methodologies of the digital environment (Figure 5), while the innovative capacity and creativity, followed by strategy, are considered more necessary for those with six to ten years of experience: "this changes a lot, I consider those abilities or skills of adaptability and restlessness to be up to date more important" (Castellanos).

Figure 4. Level of experience and tool updates (n=140)



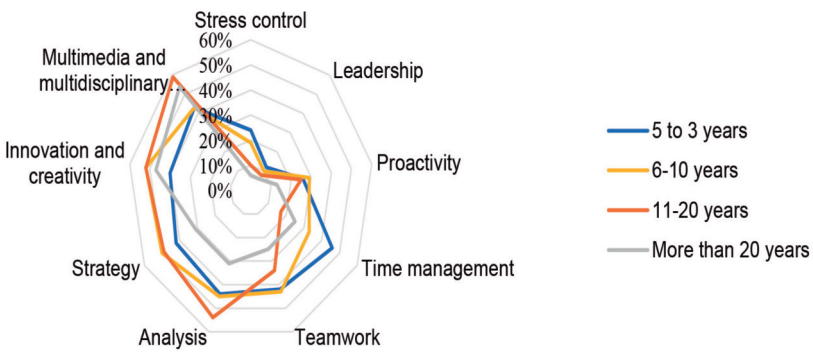
In junior planners, organization and time planning skills become more relevant, followed by analytical skills and adaptation to new multimedia and multidisciplinary environments.

4. Discussion and conclusions

This research delves into the identification of the main changes produced in media planning by the impact of digital media. Therefore, it deals with the competence review of one of the most prominent and interesting communicational profiles in the advertising sector of digital societies. Its results contribute to the understanding of the disruptive processes of digital transformation and can help update and guide university programs.

The empirical position is presented as one of its main strengths, by approaching the study of this reality through the experience of active professionals. The limitations that arise from the quantitative methodology applied, an online survey, are reduced with the application of quality criteria aimed at optimizing data collection, such as the delimitation of the observation to one of the communities that gathers a large number of media agencies. Likewise, the profile of the respondent confers guarantees in the completion of the questionnaire, since it constitutes a qualified group, acquainted with digital communication. Triangulation also adds value to quantitative analysis, facilitating the achievement of the three objectives pursued and offering, as a whole, conclusive results.

Figure 5. Level of experience and skill updates (n=140)



In light of professionals' responses, the Internet and technological progress does indeed entail substantial changes both in media planning work processes and in the update of knowledge and skills.

The digital media affect the entire known work dynamics, accelerating processes, but the essential changes are produced by the technological innovations applied to the capture and management of digital data and to the automation of space purchase; aspects that modify work team profiles and generate a corresponding demand for knowledge and skills.

On the one hand, with respect to big data, this would represent the technological component of the activity, which contributes to better audience knowledge, thereby to the design of the strategies. Companies then have their own tools, and working groups focused on research and modeling, in line with the findings of studies on digital communication of innovation in media agencies (Papí-Gálvez, 2015). Today's planners stress the importance of specialized knowledge of marketing intelligence and media management programs. The analysis and report of campaign monitoring and results also become more complex because of the availability of data, often unstructured, that needs to be processed. Everything must be measured, so current planners must master, among other aspects, the metric fundamentals of the digital environment, among which those related to web analytics stand out.

On the other hand, the emergence of new intermediaries in the digital activity, as in programmatic purchasing, requires greater conciliation of the professionals involved in the planning and purchasing processes; although it is not the most outstanding implication. The automation of these processes usually includes the possibility of displaying advertising in sync with content that is being consumed by a user. This function, which normally extends to the whole medium given its peculiarities, offers the opportunity to direct the planning towards audiences definitively and to capture them in real time, eliminating the previous selection of supports, which occupies a large part of the work of offline planning.

Thus, due to their technological profile, part of the competencies known as STEM (Science, Technology, Engineering, and Mathematics) occupy workplace positions in coexistence with the communicational ones, inherent to the activity of the advertising media planner.

Technology stimulates the creation of multidisciplinary and multimedia work teams, where planners must integrate different disciplines with a wide range of actions and formats, such as "online" media, search engines, social media, "digital signage" and "mobile", among others, coordinated with professionals from different disciplines. Studies on digital profiles in Advertising and Public Relations also highlight this hybrid nature of the sector, through the analysis of job offers in specialized portals (Álvarez-Flores, Núñez-Gómez & Olivares-Santamaría, 2018).

A global view of the whole process is necessary. The strategic component remains a priority and defines the activity's performance, as an important part of advertising communication. The effect of digital media on the strategic phase of the media function does not, in fact, change the approach itself, but takes place in the proposals, i.e., in the design of concrete strategies, which know how to exploit the potential of the digital environment. In addition, the results of this study indicate that, in the face of this new ecosystem, it is possibly more necessary to activate the capacity for innovation that was already present in the proposal for creative media plans (Sissors & Baron, 2010), with the intention of generating value or some competitive advantage.

Consequently, while professionals in this field of specialization must now acquire knowledge of data exploration tools and techniques that optimize actions and facilitate the visualization of post-campaign results, they must also be able to provide communication solutions based on effectiveness and efficiency, adapted to the new model. The specificities of digital environments demand, in short, specialized but also connected knowledge.

According to this study, there is no doubt that the advent of the digital society substantially modifies the conditions under which traditional media planning operates; but this transformation does not entail a loss of the importance of the media function in advertising, quite the contrary. The responses of the professionals in this study support the reflections reflected in other texts (Perlado- Lamo de Espinosa & Rubio-Romero, 2009; Papí-Gálvez, 2014). The media planner profile, whose definition seemed to be anchored in the most operational part of the activity, is broadened by integrating research and analysis skills. In addition, audience orientation decreases the tactical stage in favor of the strategic phase.

However, despite the transformations that the planner's profile has already undergone, it is evident that the planner remains immersed in the process of change. The analytical capacity and the overall vision, enhanced by the ability to create and innovate, are competencies identified as priorities in current planning, which is fed by hybrid profiles, technological and communicational, to provide effective solutions.

In short, the media planner gives way to the media expert, who, while including the operational approach of the former, also highlights the knowledge and skills needed to perform this activity in today's societies.

Notes

[1] The EAPS recorded 103,500 persons in the advertising sector according to the National Classification of Economic Activities of Spain CNAE 09-73 (CNAE, 2016).

[2] A leading company. It carries out market analyses in communication, marketing and advertising (www.scopen.com).

[3] Twenty percent of the companies registered in the National Classification of Economic Activities in Spain (CNAE) belonged to media agencies, so this percentage was applied to obtain the approximate number of employees that these companies had (Scopen 2015). In order to estimate the number of planners within them, Carat, Equmedia, Forward, Havas Media, Initiative and Maxus were consulted.

[4] Data Management Platform (DMP) is a tool that allows aggregating and centralizing different types of data that are obtained from the actions in different communication vehicles.

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References

Advance Television (Ed.) (2018). *US: Smartphone time to overtake TV in 2019*. http://bit.ly/2Mg5eUk

AIMC (Ed.) (2018). *Marco General de los Medios en España 2018. Madrid: Asociación para la Investigación de los Medios de Comunicación*. https://bit.ly/2Dh0AET

Álvarez-Flores, E.P., Núñez-Gómez, P., & Olivares-Santamaría, J.O. (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), 136-147. https://doi.org/10.3145/epi.2018.ene.13

Asociación General de Empresas de Publicidad & Federación Nacional de Empresas de Publicidad (Eds.) (2009). *Radiografía del sector publicitario*. Madrid: AGEP. https://bit.ly/2RedLxG

Beales, H. (2010). *The value of behavioral Targeting. Network Advertising Initiative*. http://bit.ly/2wXNJ6J

Benavides-Delgado, J., Villagra-García, N., Alameda-García, D., & Fernández-Blanco, E. (2010). Spanish advertisers and the new communication context: A qualitative approach. *Revista Latina de Comunicación Social*, *65*, 159-175. https://doi.org/10.4185/rlcs-65-2010-890-159-175-en

Cabrera-González, M. (Coord.) (2010). *Evolución tecnológica y cibermedios*. Sevilla: Comunicación Social.

Canada Media Fundation (Ed.) (2018). *Informe de tendencias 2018. El choque del presente*. http://bit.ly/2QflhoJ

Cardoso, G. (2011). Más allá de Internet y de los medios de comunicación de masas. *Telos*, *86*, 1-10. http://bit.ly/2wZEtyD

Christensen, C.M. (2014). Disruptive innovation. In M. Soegaard & R.F. Dam (Eds.), *The encyclopedia of human-computer interaction* (2nd ed.). Aarhus, Denmark: The Interaction Design Foundation. http://bit.ly/2oSBrrF

CNAE (Ed.) (2016). *Código Nacional de Actividades Económicas*. https://bit.ly/2O945jm

Del-Pino-Romero, C., & Galán-Fajardo, E. (2010). Internet y los nuevos consumidores. El nuevo modelo publicitario. *Telos*, *84*, 55-64. http://bit.ly/2wY3SJm

Flores-Vivar, J.M. (2009). New models of communication, profiles and trends in social networks. [Nuevos modelos de comunicación, perfiles y tendencias en las redes sociales]. *Comunicar*, *33*(XVII), 73-81. https://doi.org/10.3916/c33-2009-02-007

González-Lobo, M.A. & Carrero-López, E. (1999). *Manual de planificación de medios*. Madrid: ESIC.

GroupM (Ed.) (2018). *The state of digital report*. April 2018. http://bit.ly/2N0gtWj

IAB Spain (Ed.) (2014). *Libro blanco de compra programática*. Madrid: IAB Spain. http://bit.ly/2NuaOY4

IAB Spain (Ed.) (2018). *Estudio del mercado laboral en marketing digital*. Madrid: IAB Spain. https://bit.ly/2rAU9FG

Infoadex (Ed.) (2018). *Estudio Infoadex de inversión publicitaria en España, 2018*. Madrid: Infoadex. https://bit.ly/2Iu9u14

Kantar Media (Ed.) (2017). *Dimensión. Planificar en un mundo disruptivo*. http://bit.ly/2oQMLo2

Katz, H. (2017). *The media handbook. A complete guide to advertising media selection, planning, research, and buying* (6th Ed.). New York: Routledge.

Kumar, V., & Gupta, S. (2016). Conceptualizing the evolution and future of advertising. *Journal of Advertising*, *45*, 3, 302-317. https://doi.org/10.1080/00913367.2016.1199335

Livingstone, S. (1999). New media, new audience? *New Media & Society*, *1*(1), 59-66. https://doi.org/10.1177/1461444899001001010

López-García, X., Rodríguez-Vázquez, A.I. & Pereira-Fariña, X. (2017). Competencias tecnológicas y nuevos perfiles profesionales: desafíos del periodismo actual. [Technological skills and new professional profiles: present challenges for journalism]. *Comunicar*, *53*(XXV), 81-90. https://doi.org/10.3916/C53-2017-08

López-Vidales, N. (2005). Los medios audiovisuales en el tercer milenio. Atrapados en la 'tela de araña'. *Telos*, *62*, 72-80. http://bit.ly/2N1ThqI

Maheshwari, S. & Koblin J. (2018). *May, 3. Why traditional tv is in trouble*. The New York Times. https://nyti.ms/2N0lJrY

Martín-Guart, R.F., & Fernández-Cavia, J. (2012). La digitalización como eje de transformación de las agencias de medios españolas. *Pensar la Publicidad*, *6*(2), 427-445. https://doi.org/10.5209/rev_PEPU.2012.v6.n2.41243

Ministerio de Empleo y Seguridad Social (Ed.) (2016). *Boletín Oficial del Estado*, *35*, 10485-10487. http://bit.ly/2NvuT07

Observatorio de la Publicidad en España (Ed.) (2016). *La comunicación comercial en cambio permanente*. Asociación Española de Anunciantes (AEA). Madrid: ESIC.

Papí-Gálvez, N. (2014). Los medios online y la ¿crisis? de la planificación de medios publicitarios. *AdComunica*, *7*, 29-48. https://doi.org/10.6035/2174-0992.2014.7.3

Papí-Gálvez, N. (2015). Nuevos medios y empresas innovadoras. El caso de las agencias de medios. *El Profesional de la Información*, *24*(3), 301-309. https://doi.org/10.3145/epi.2015.may.10
Papí-Gálvez, N. (2017). *Investigación y planificación de medios publicitarios*. Madrid: Síntesis.
Pérez-Curiel, C., & Luque-Ortiz, S. (2018). El marketing de influencia en moda. Estudio del nuevo modelo de consumo en Instagram de los millennials universitarios. *AdComunica*, *15*, 255-281. https://doi.org/10.6035/2174-0992.2018.15.13
Perlado-Lamo-de-Espinosa, M. (2013). Nuevas oportunidades en la comunicación digital. Nuevos perfiles y competencias. In I. De-Salas, & E. Mira (Coords.), P*rospectivas y tendencias para la comunicación en el siglo XXI*. Madrid: CEU Ediciones.
Perlado-Lamo-de-Espinosa, M., & Rubio-Romero, J. (2009). ¿Qué competencias exige el sector publicitario a los nuevos profesionales de la comunicación comercial?: Un acercamiento a las actitudes y habilidades de los titulados en Publicidad. In M. Martín-Llaguno, & A. Hernández-Ruiz (Coords.), *Los límites de la comunicación comercial y la comunicación comercial al límite. Reflexiones sobre los discursos, procesos y experiencias.* Madrid: Asociación Española de Agencias de Publicidad.
Perlado-Lamo-de-Espinosa, M. (2006). P*lanificación de medios de comunicación de masas*. Madrid: McGraw Hill.
Ros-Diego, V. (2008). *Branding en la era Web 2.0. Actas del IX Foro de Otoño de Comunicación*. Madrid: Edipo.
Salaverría, R., & García-Avilés, J.A. (2008). La convergencia tecnológica de los medios de comunicación: Retos para el periodismo. *Trípodos 23*, 31-47. http://bit.ly/2QkEVzS
Sánchez-Sánchez, C., & Fernández-Cavia, J. (2018). Percepción de profesionales y académicos sobre los conocimientos y competencias necesarios en el publicitario actual. *Revista Latina de Comunicación Social*, *73*, 228-263. https://doi.org/10.4185/RLCS-2018-1254
Schultz, D. (2016). The future of advertising or whatever we're going to call it. *Journal of Advertising*, *45*(3), 276-285. https://doi.org/10.1080/00913367.2016.1185061
Scopen (Ed.) (2015). *Best place to work 2015: Agencias de medios. Grupo Consultores.* http://bit.ly/2CKZUcf
Sissors, J.Z., & Baron, R.B. (2010). *Advertising media planning* (7th ed.). New York: McGrawHill.
Soengas, X. (2013). Retos de la radio en los escenarios de la convergencia digital. *AdComunica*, *5*, 23-36. https://doi.org/10.6035/2174-0992.2013.5.3
Solana, D. (2010). *Postpublicidad. Reflexiones sobre una nueva cultura publicitaria en la era digital* (2ª ed.). Barcelona: Doubleyou.
Van-der-duff, R. (2008). The impact of the Internet on media content. In I. Kung, R.G. Picard & R. Towse (Eds.), *The Internet and mass media*. London: Sage. https://doi.org/10.4135/9781446216316.n4
We are Social & Hootsuite (Ed.) (2018). Digital in 2018: Essential insight into Internet, social media, mobile ans ecommerce ise aroubd the world. We are Social & Hootsuite. http://bit.ly/2O2VJJW
Zenith Media (Ed.) (2018). *Advertising expenditure forecasts March 2018. Executive summar.* http://bit.ly/2oVU2D3

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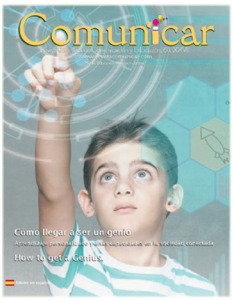

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