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Communicating in an ageing world: challenges and opportunities

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THEMATIC EDITOR:
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Uses and Gratifications of Computers in South African Elderly People

Usos y gratificaciones de los ordenadores en personas mayores en Sudáfrica

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ABSTRACT

Drawing on in-depth interviews conducted with residents at an old-aged home in Cape Town, South Africa, this study examines the main uses and gratifications elderly people get from computers. While the research focus in Africa has been on the health of elderly people, particularly with respect to HIV/AIDS, there is little research into their adoption of new technologies, as the research focus with respect to that topic has been primarily on youth. This study found that the participants use email and social media to maintain contact with family and friends outside of, and sometimes even within the neighborhood. Furthermore, keeping in contact involved not only communication, but also observation of activities – like news, photographs and discussions. Using a uses and gratifications framework, this study found that participants felt connected with society both through their communication with and observation of people, and through keeping themselves informed about news and current interest topics. By using the Internet the elderly people communicated with more people than they had before. Some of the participants felt less isolated and lonely because of their computer use. Nevertheless, use of computers did not weaken their interpersonal contact outside of computer use.

RESUMEN

A partir de entrevistas en profundidad, realizadas en un hogar de la tercera edad en Ciudad del Cabo (Sudáfrica), este estudio analiza los principales usos y gratificaciones que reciben las personas mayores en interacción con los ordenadores. En África, mientras el énfasis investigador se ha puesto en los últimos años en la salud de los mayores, especialmente en cuanto al SIDA, existe muy poca investigación sobre el uso de los mayores en cuanto a nuevas tecnologías, ya que la investigación en relación con las mismas se ha centrado principalmente en la juventud. En este estudio se halló que los participantes utilizan el correo electrónico y las redes sociales para mantener el contacto con familiares y amigos y a veces incluso con su vecindario. Además, mantener el contacto suponía no solo comunicación, sino también observación de actividades, como noticias, fotografías y conversaciones. En el contexto de los usos y gratificaciones, el trabajo ha evidenciado que los participantes se sentían conectados con la sociedad, tanto por su comunicación como por la observación de las personas, y por mantenerse informados de las noticias y los temas de interés actuales. Mediante el uso de Internet, las personas de edad avanzada se comunicaban mucho más de lo que antes se habían comunicado con otras personas. Algunos de los participantes se sentían menos aislados y solos, debido a su uso del ordenador. Sin embargo, se demostró también que el uso de los ordenadores no obstaculizó los contactos interpersonales tradicionales.

KEYWORDS | PALABRAS CLAVE

Uses and gratifications, older adults, computer use, social networking sites, social media, Internet.
Usos y gratificaciones, mayores, destreza informática, redes sociales, medios, Internet.

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1. Introduction

Gilly & Zeithaml (1985) wrote that «interest in the elderly [had] burgeoned in the last ten years because this demographic segment –defined as adults aged 65 and older– [had] expanded in size and spending power» (353). The interest they referred to had mostly been consumer market research in the USA, and they explored whether older adults were using new consumer-related technologies. Findings showed that older adults held negative views of innovations and were not quick to adopt new innovations. They were also not as aware of new technologies as younger people were. The research used these findings to make recommendations for making technologies and sources of information more accessible and useful to older adults.

During the 1990s the focus became more specific – researching recommendations for making computers more accessible and useful to older adults. This research trend was located mainly in the field of educational gerontology in the USA. The older adult age group was still expanding in size, the 75+ age group being the fastest growing age group in the USA (Lawhon & Ennis, 1996). Trends during the period leading up to 1985 suggested that older adults were unwilling and unable to use new innovations, like computers. It was predicted that computer illiteracy among older adults would increase as the size of the age group increased (Baldi, 1997; Morgan, 1994). As a result, the overarching recommendation that came out of research in the 1990s was for computer skills training courses for older adults. It was found that older adults approached such courses with a positive view, believing in the suggested benefits of computer use (Morgan, 1994). The conclusion was that previous research results related to older adults' use of new technologies could not be applied to older adults' use of computers, especially where older adults were offered computer skills training courses specific to their age group's needs. Recommendations were then also made for adapting computer software interface design to cater for older adults' needs (Hutchison & Eastman, 1997).

Going into the new millennium, the Internet –as the newest medium of communication– still occupied, with computers, significant research space (Ruggiero, 2000).While progress was made in discovering how best to adapt computer training and the Internet to users' needs, it was recognised that a better understanding of these needs would illuminate why different users came away from their experience with computers with varying degrees of satisfaction and partiality (Papacharissi & Rubin, 2000). Consequently, uses and gratifications studies often appeared in research into older adults' media use. Mellor, Firth and Moore (2008) conducted quantitative and qualitative research in Australia to investigate whether the use of computers and the Internet could lower levels of social isolation of older adults. However, the results were mixed, with surveys showing that the older adults' overall well-being did not significantly improve, but the older adults saying in interviews that they did benefit from using computers and the Internet. In another study in Australia in 2008, quantitative research showed that reduced feelings of loneliness in older adults appeared where they used the Internet for communication, but not where they used it to make new social contacts (Sum, Mathews, Hughes & Campbell, 2008).

More recently, a uses and gratifications study in the USA focused on social networking that older adults engaged in online. A survey had shown that «about 51% of all Americans aged 50-64 and 33% of those over 65 had a Facebook account, although a lot less [were] regular daily users» (Ancu, 2012: 1). In 2013, Lelkes's research in Europe reported results similar to those of Mellor et al. (2008) in Australia. It found that older adults who used the Internet reported that their well-being benefitted from this. It also found that the more older adults used the Internet, the less they experienced social isolation outside of Internet use.

In summary, research over the past forty years or so has identified various reasons why older adults use media – for information, entertainment and social utility, with social utility including communicating with others in society and making new social contacts. Research has also explored how these uses have affected older adults' sense of loneliness versus community, how the uses have affected their social involvement (networking versus isolation) and how they feel about that, and how they feel about their well-being. The research covered in this review was conducted in the USA, Australia and Europe, and displays a movement from the general – new technologies and innovations –to the more specific– computers, the Internet, then Facebook.

Since life expectancy in South Africa is lower than in the USA or Europe there has not been the same extent of research trends around the older adult age group. In addition, South Africa's economic climate differs from those in the USA, Australia or Europe in ways that cause differences in the populations' use of computers. A uses and gratifications study of older adults' computer use in South Africa thus makes new contributions to existing research.

South Africa is placed 5th in Africa for Internet usage with only 2.2 out of every 100 people connected to broadband services, but mobile broadband subscriptions are growing at a rate of 30% per year[1]. Despite the digital divide, Internet access in South Africa is growing with 40.9% of South African households having access to the Internet at home or elsewhere in 2013 (Statistics South Africa, 2013). The growth of the mobile Internet has meant that more people use their mobile phones to browse the Internet, and as a result there is wide popularity of social networking sites such as Facebook and Twitter (Donner & Gitau, 2009).

2. Statement of the problem

Research into elderly people's (aged 65 and above) use of media has developed as the demographic has grown in size and spending power (Gilly & Zeithaml, 1985). In South Africa, the older population has had to adapt to a changing society, as a result of political changes and the dynamics of society which led to migration of young people to cities for jobs (Bohman & al., 2007). While the research focus in Africa has been on the health of elderly people, particularly with respect to HIV/AIDS, there has been little to no research into their adoption of new technologies, as the research focus here has been primarily on youth. The elderly are an important section of society and it is important to study their use of media, particularly as it may have implications for intergenerational communication.

Drawing on interviews conducted with residents at an old-aged home in Cape Town, South Africa, this study examines the main uses and gratifications elderly people get from computers. Firstly, the study asked, why do they use computers? This explored whether they used computers for sending emails to or receiving emails from family, friends, colleagues or subscriptions, playing games, finding information via search engines, watching or listening to media, engaging with social media, or any further uses. Secondly, the study asked, what are the effects of these uses on elderly people? I.e. whether advantages included strengthened contact with others in society either through the computer only or outside of computer use too, weakened contact with others in society outside of computer use, a higher or lower sense of affiliation with others in society, relief from boredom, greater or reduced feelings of loneliness, or anything else.

The present study emphasises how the use of computers affects elderly people's social connections. The impact of the Internet on social connections is under-researched, with some literature concluding that the Internet strengthens interpersonal contact and other literature concluding the opposite (Hogeboom, McDermott, Perrin, Osman & Bell-Ellison, 2010). In 2012 statistics showed that the fastest growing age group to use social networking sites (e.g. Facebook) were older adults (Ancu, 2012). Therefore a study of how elderly people use computers and how they are consequently affected is of significance, particularly in the African context where the focus has been primarily on youth adoption of new technologies and social media.

Moreover, a uses and gratifications approach to this study is appropriate as the intention is to understand why and how elderly people seek out specific media to satisfy specific needs. According to Katz, Blumler and Gurevitch's (1973-1974) seminal research in this area, the audience is active and seeks out 5 potential uses of media: information, identifying with media characters, simple entertainment, to enhance social interaction or to escape from the stress of daily life. The uses and gratifications approach is a theoretical approach that seeks to understand why and how

> Research over the past forty years or so has identified various reasons why older adults use media – for information, entertainment and social utility, with social utility including communicating with others in society and making new social contacts. Research has also explored how these uses have affected older adults' sense of loneliness versus community, how the uses have affected their social involvement (networking versus isolation) and how they feel about that, and how they feel about their well-being.

people choose specific media to satisfy specific needs. The emergence of computer mediated communication revived the uses and gratifications approach (Ruggiero, 2000), which sees the audience as active though it does not explore media content or take into account the socio-cultural context.

3. Methodology

The methodology for this research article was in-depth interviews, focusing on a limited number of participants. Given that the interpretive paradigm is what underlies this study, a qualitative research design was the best approach. The interpretive paradigm has to do with the everyday behaviour of people in interpreting events and creating meaning (Wimmer & Dominick, 2006). Similarly, qualitative research is conducted to «describe routine and problematic moments and meanings in individuals' lives» (Denzin & Lincoln, 1994: 2).

> The present study emphasises how the use of computers affects elderly people's social connections. The impact of the Internet on social connections is under-researched, with some literature concluding that the Internet strengthens interpersonal contact and other literature concluding the opposite.

This study was informed by the notion that older adults use computers for particular reasons, and further guided by the notion that older adults obtain particular gratifications from computer use. The interpretive paradigm underlying the qualitative approach to this study is logical because the use of computers is an everyday, routine behaviour of individuals –in this study, older adults– in response to problems of social inactivity, boredom, loneliness or anything else; and the gratifications from computer use are meanings created by these individuals as they interpret the effects of their computer use.

Use of in-depth interviews was the methodological choice because the participants could be observed and in-depth information such as their deeper thoughts and the meanings behind their words could be collected from them. According to Denzin and Lincoln (1994: 361), «interviewing is one of the most common and most powerful ways we use to try to understand our fellow human beings». Participants were drawn from the pool of residents of the Glen Retirement Hotel (pseudonym). This was a hotel in Cape Town that was converted in 2012 to a home for the elderly. Its communal areas are a dining-room, lounge, sunroom, bar and reading room and, more significantly for this study, a computer area equipped with two computers. In addition, there is Wi-Fi access in the computer area, lounge, and bar and reading room. The Glen is within walking distance of a beach and other social locales. The Glen is located in an affluent socio-economic area and it was assumed that sample would include affluent grandparents who use the Internet to communicate with loved ones outside of the neighborhood. Moreover, interviews included questions about social networking via the Internet versus social networking in the Glen's communal areas (without use of the Internet) and the neighborhood's social locales.

Residents aged 65 and older who used computers and for whom English was a first language were invited to sign up to be interviewed. Six residents out of The Glen's 25 residents met the age requirements –they were all 73 and older– and used the computers or Internet at The Glen. In the research discussed in the literature review, the most significant qualitative research was conducted by Mellor, Firth and Moore (2008) using 20 participants over 12 months. The data for this study was collected over one week –the times offered by the Glen– and six residents were interviewed. As a result, the conclusions drawn from this sample serve only the purposes of this study and cannot be generalised.

Since this research made use of human subjects as sources of data, based on the University of Cape Town (UCT) Code for Research involving Human Subjects, informed consent was secured from the research subjects in this study, offering privacy and confidentiality to participants who wished to remain anonymous – no information that reveals participants' identities has been included in this article. The interviews took place in a neutral venue at The Glen where noise would not interfere negatively with the quality of the recordings. As an ethical consideration, participants were asked permission for the interviews to be recor-

ded after a rapport had first been built with them. Pre-set interview questions were at first general, progressing into more specific and possibly less comfortable questions for the participants to answer. Discretion was exercised regarding how far participants were allowed to go off topic before they were brought back to the purpose of the interviews. Time was monitored as participants should not become bored or weary. No single interview was allowed to last longer than 45 minutes. Data was not only collected in recordings but also in observation notes made during interviews and visits to The Glen.

This data was analysed using thematic analysis as described by Braun and Clarke (2006). The observation notes aided in selection of extracts to be transcribed from each interview's recording. The extracts selected were those that pertained to the interview questions, both pre-set and spontaneous follow-up questions. Initial codes were then written onto the transcription. These are the key points identified. As the theoretical framework of this study is uses and gratifications, the initial codes that were identified were points that related to why the participant used computers and how the participant was affected by this computer use. Next, the initial codes were grouped into themes. After that, the final themes and subthemes were sorted and consolidated and were those that emerged across, not within, interviews. These were about social networking via the Internet, and social networking without using the Internet, and how the one affects the other.

It is a limitation of this methodology that the conclusions drawn in the research article cannot be generalised. However, an advantage of the in-depth interviews as methodological choice is that the data collection times were free and uninterrupted. The advantage of this study's qualitative approach is that it supports a recent trend in uses and gratifications research of investigating subjective experience of new media use –especially to see «the extent to which these media… create dependency or replace other forms of human communication» (Sherry & Boyan, 2008: 5.242).

4. Results and discussion

a) Use of computers. The three eldest participants, aged early 80s to early 90s, were the more regular computer users. One of them had a Macintosh computer and his own Internet connection in his room, and used this every evening. Another participant also had her computer in her room with her own Internet connection, and used it every night. The third one used her laptop in The Glen's computer area two or three times a day for various periods of time depending on what was on email and Facebook. Of the three youngest participants, all in their 70s, only one used the computer on a regular basis –a couple of times a week, usually Skyping on a Sunday evening. The other two wanted to use the computer to email more regularly.

All six of the participants used email, mostly to correspond with family and friends. One of them used to correspond with colleagues but had not done so since he retired. He wanted to start using The Glen's computers to email his son living 50 kilometers away, a cousin living in Canada and granddaughters living in Gauteng. Another participant had only started using computers three months previously and had only ever sent about three emails to her son living on an island off the coast of Spain. These two participants were among the youngest of the six participants. One of the eldest participants was subscribed to the Yacht Club's newsletter emails.

Half of the participants used computers to play card games. One of them also played Scrabble, an application on Facebook. She said:

«It's lovely because you can take all the time in the world. And you can put in words and you can take them out and you can take all day. [My friend has] got her laptop at home and she plays and when she's had her turn then it comes my turn» (interview, May 9, 2014).

Setting one's own pace when using media is a preference that emerged before 1985 in research into older adults' sources of information about new technologies. Because of this preference, whereas younger people's main source of information about technologies was television (a medium that presents information at an externally set pace), older adults' main source of information was newspapers which can be read at a self-controlled pace (Gilly & Zeithaml, 1985). One of the participants who did not play computer games found it too difficult to control the mouse. Another said that games were a waste of time.

The three eldest participants used Google to find information. One of them also did all his banking online but expressed concern about security, which was a reason given by another for not using online banking. One of the three youngest participants wanted to start using The Glen's computers to use the Internet for general knowledge. Only one of the participants played DVDs and listened to music on the computer. He said that he had a music library of 10,000 tracks. He also used an application called Desktop Lyrics so

that the songs' lyrics would appear on the computer screen when they were played. In addition, he used the computer to type and print letters to the media, read online newspapers, make posters for The Glen's notice-board, and scan photographs to save them and sometimes to create slideshows. Another participant kept photographs of her family on her laptop. A third participant, although she emailed some people, also used the computer to type and print regular letters to post to a friend.

With regard to social media, it was the three eldest participants who used Facebook. Two of them brought up the subject of Twitter without being asked about it in the interview, one of them saying he used it and another saying that she did not use it as she did not know how. Three participants used Skype and a fourth wanted to start using Skype. The participant who used a Macintosh said he belonged to three Mac user groups. Research has shown that elderly people would benefit from using computers not only for information, but also for entertainment, social utility, and business or daily functions (Lawhon & Ennis, 1996). The uses and gratifications theory that frames this study maintains that «audience members actively [select] media products to satisfy a range of needs: new information, entertainment, news, relaxation, and more» (Melkote, 2002: 427).

b) Entertainment and relaxation gratification. Gratification from using computers for entertainment or relaxation was not very prevalent across interviews. Nevertheless, one of the effects of this use was relief from boredom. One participant said: «If I'm not going out I come down in the morning and [use the computer], and then I'll come down again in the afternoon I suppose – two or three times a day, if I'm not going anywhere else» (interview, May 9, 2014). This participant's emphasis that she used the computer only if she was not going out suggested that her computer use was her entertainment and relief from boredom at The Glen.

Another participant said that he played Solitaire on the computer whenever he was put on hold when making a call to a service provider. While this particular situation may not be something that happened very often, this same participant explained that he used the computer to keep himself mentally active. For example, writing had been part of his profession, so after he retired he decided he would write letters to the media and use the dictionary and thesaurus on his computer to help maintain the quality of his language usage.

c) Information and social utility gratifications. Across half of the interviews it emerged that the older adults obtained gratification from using computers for information. Two of the eldest participants said that during conversations they made mental notes of things they wanted to know more about, and then googled these when they were in front of the computer. According to Chandler and Munday (2011), «using the mass media as conversational currency» is an example of social utility use because it increases «contact with others» and is derived «from a need of individuals for affiliation» (399). Therefore these two participants obtained both information and social utility gratifications from googling information for conversational currency.

These same two participants also read news online. One of them had impaired hearing and used Google to supplement information from songs (like lyrics) and films (like plot revealed in dialogue). According to the older adults, online information was convenient, and helped them «keep track of things» and appreciate more. One of the participants who wanted to use the computer to email more regularly also wanted to start using computers for information –email and information were the only computer uses that were important to him.

Overall, the greatest gratification that the older adults obtained out of computers was from social utility usage. Email and Skype were used to communicate with family and friends both near and far. Email was preferred above SMS because more could be said, above handwritten letters because less could be said and above phone-calls because it was cheaper. The three participants who used Skype found it easy but were not completely satisfied, the most common reason being uneasiness with seeing the other person and being seen.

Social utility via Facebook was more observation than communication. A uses and gratifications study in the USA found that most older adults did not use Facebook for communication, but rather for entertainment; yet, this was still a social utility usage as it included observing friends' Facebook activity (Ancu, 2012). The older adults in my study obtained gratification from viewing news posted on Facebook pages, and even more from viewing photographs posted by family. Some posts provoked a response and brief communication with Facebook friends, but the most significant effect of Facebook use on participants appeared to be a sense of affiliation with family as they followed their lives in photographs. Other examples of computer use that affected the older adults with a higher sense of community with others in society were the Yacht Club newsletters that one participant re-

ceived via email, and the forum discussions that another participant followed within the Mac user groups he was part of.

It becomes apparent that a sense of affiliation or community is linked with the sense of «keeping track of things» that was obtained from getting information from the Internet. As with conversational currency, this reveals a link between the information and social utility uses of computers. The notion has been confirmed through a 2009 survey that found that older adults in Australia who used the Internet for communication, as well as those who used it for information, felt a greater sense of community (Sum & al., 2009). The notion is further supported by this study's findings that the three participants who used Google to find information were also the three participants who used Facebook. And two of them were also members of, respectively, the Yacht Club and the Mac user groups.

These same three participants were the more regular computer users in the study. One of them explained his regular use of the computer: «My wife was ill for 10 years and I looked after her the last four years of her life because she was immobile. And being stuck in the house, not being able to go away too often, [using the computer] was my relief, to keep in touch with what was going on in the rest of the world. So that created a habit that this is the way I keep myself interested. It's just carried on really» (interview, May 9, 2014). This illustrates the point that participants who used computers for information and social utility experienced reduced feelings of loneliness and lower levels of social isolation. Another one of the three participants in question said: «I'm very sold on computers. My life would not be the same without a computer. I would be totally isolated from my family. I mean how often does anybody actually ever call, you know? My life is 100% better because of computers. It would be good anyway because I keep busy but when I don't have it I feel quite bereft» (interview, May 9, 2014).

d) Social networking with and without the Internet. As 1980s and 1990s uses and gratifications researcher, Rubin (as cited in Sherry & Boyan, 2008) specified, «media use is just one of many alternatives people have; thus media competes with other communication to best satisfy needs and motives» (5239).

The older adults in this study made contact with others in society via email. All of them emailed people living in different cities or countries, while half of them also emailed people living nearby – people they also contacted in person from time to time. The older adults described social networking via the Internet as non-intrusive. One participant saw this positively, saying, «I'd prefer to communicate with my son by email because he's got his life to live; he's got his family and I don't want to interfere, so it would be easier to email» (interview, May 9, 2014). For another participant, non-intrusive meant distant and she preferred person-to-person communication. A third participant said that although emails came across as stilted, at least they were accurate. Whether viewed positively or negatively, half the participants acknowledged that social networking via the Internet had increased their contact with some people.

The older adults were not so dependent on social networking via the Internet that other forms of human communication were replaced. The participants made phone calls to various people. There was interpersonal contact in The Glen's communal areas; and four of the participants showed significant motivation for going out often and connecting with others in local social locales. Two of the participants still wrote letters to friends who did not use computers. Although it was at times more convenient for some participants to find information online, their contact with others in society outside of computer use was not weakened. Only one of the participants avoided the company of too many people, saying that she was a private person

> Overall, the greatest gratification that the older adults obtained out of computers was from social utility usage. Email and Skype were used to communicate with family and friends both near and far. Email was preferred above SMS because more could be said, above handwritten letters because less could be said and above phone-calls because it was cheaper.

and that her husband was losing his memory and did not like noise around him.

The older adults were private about their computer use. The Glen's computer area was usually only occupied by one person at a time and the participants did not usually talk with other people about their use of the computers. There were two exceptions. Firstly, there were two participants who from time to time would try to get their husbands interested in what they were doing on the computer. Secondly, five of the six participants would from time to time give or receive help with using computers.

The participants used games and other media on computers for entertainment and relief from boredom, but these were not main uses and gratifications in the findings. Future research might compare use of computers by different age groups within the older adult age group, as in this study the eldest participants got more uses and gratifications out of computers than the youngest participants.

In the 1990s, research showed that older adults came away from computer skills training courses feeling more familiar with computers and therefore more confident – both about computer use and about their place as older adults in a technological society (Morgan, 1994). One of the participants in this study supported these findings when she spoke about the help she received, and passed on, with using the computers at The Glen:

«They were quite eager for people to learn. Why not? It's not difficult. Now I Skype my brother. I used to contact him by phone, letter –the old fashioned way. Skype is nice. It's nice to be able to see them and chat to them. There's one lady here whose son is on an island off the coast of Spain so I sometimes help her to get through on Skype– not that I'm an expert» (interview, May 9, 2014).

Furthermore, while participants did not usually talk with other people about their use of the computers specifically, there were two participants whose use of computers strengthened their contact with others in society outside of computer use. Similarly in Japan, Kanayama (2003) found that elderly people are becoming part of virtual communities, increasing social connectedness to others by sharing stories and memories online. The participant who played Scrabble with a friend via Facebook also emailed this friend and met up at the Yacht Club every Friday where some of their topics of conversation would come from their Scrabble game or emails. And a participant who liked to help people in need provided face-to-face counsel with these people and kept in contact with them afterwards via email.

Research conducted in the USA in 2010 quantitatively explored correlations between older adults' Internet use and their social networking outside of Internet use, and added «to the body of research that [suggested] Internet use [could] strengthen social networks» (Hogeboom & al., 2010: 93). The two examples from this study of participants whose use of computers strengthened their contact with others in society outside of computer use also add to this body of research.

5. Conclusions

The main uses and gratifications elderly people get out of computers in South Africa were explored in this study. From in-depth interviews with six residents of The Glen Retirement Hotel it was found that the elderly people used email and social media to keep in contact with family and friends outside of, and sometimes even within the neighborhood. The primary gratification was thus to enhance social interaction, as well as information seeking. Furthermore, keeping in contact meant not only communication, but also observation of activity – like news, photographs and discussions. It was in this computer usage that information and social utility gratifications overlapped. Participants felt connected with society both through communication with and observation of people, and through keeping themselves informed about news and topics that came up in conversation. By using the Internet they communicated with some people more than they had before. Some of the participants felt less isolated and lonely because of their computer use. Nevertheless, use of computers did not weaken their interpersonal contact outside of computer use. Most of the participants used The

Glen's other communal areas more than they used the computer area. Although there were participants who kept in contact with people within the neighborhood via email, this did not replace face-to face communication with these people in local social locales. Instead, in one case it provided topics of conversation (like Scrabble), and in another it allowed communication to continue (beyond one in-person counselling session).

The participants used games and other media on computers for entertainment and relief from boredom, but these were not main uses and gratifications in the findings. Future research might compare use of computers by different age groups within the older adult age group, as in this study the eldest participants got more uses and gratifications out of computers than the youngest participants.

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Use, Consumption and Knowledge of New Technologies by Elderly People in France, United Kingdom and Spain

Uso, consumo y conocimiento de las nuevas tecnologías en personas mayores en Francia, Reino Unido y España

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ABSTRACT

Our population is ageing very quickly. This increase is added to the rapid, exponential breakthrough of new technologies in our everyday lives. These two factors are generating great interest and many studies have been published on how information technology and communication simultaneously exist in ageing western societies. This paper analyses the main habits of use and consumption of new technologies by older people, in particular, the level of knowledge and their level of education. The purpose is to analyse whether the technological skills of our elderly are sufficient, as well as to know if the audio-visual resources are appropriate. This study wants to know if the ageing society is prepared to handle everything the Internet has to offer. This study has taken place in three countries of the European Union: the United Kingdom, France and Spain. An attempt is made to generate comparisons and conclusions that help to increase the opportunities and to take on challenges of our current digital society. This study has used a methodology based on surveys which collect information on the use and habits in the three countries and the level of media literacy, as well as the interest of our elderly in training in new technologies.

RESUMEN

La población está envejeciendo de una manera muy rápida. A esta realidad hay que añadir el exponencial y rápido avance de las nuevas tecnologías en nuestras vidas cotidianas. Este binomio está generando gran interés y muchos son los estudios sobre la convivencia de las tecnologías de la información y de la comunicación en los diferentes colectivos de las envejecidas sociedades occidentales. Este trabajo analiza los principales hábitos de uso y consumo de las nuevas tecnologías en las personas mayores pero, sobre todo, el nivel de conocimiento y preparación que tienen. La finalidad es comprobar si la competencia mediática en materia tecnológica de nuestros mayores es la adecuada, así como conocer la adecuación de la oferta audiovisual actual. Este trabajo quiere responder a la cuestión de si los públicos de una sociedad europea envejecida están preparados ante la gran oferta online. Con este fin, se estudian los datos de tres grandes países de la Unión Europea como son Francia, Reino Unido y España, intentando establecer comparaciones y conclusiones que ayuden a aumentar las oportunidades y retos de nuestra actual sociedad digital. Para ello, se ha utilizado una metodología basada en encuestas de elaboración propia en los tres países en las que se retratan tanto los hábitos de uso y consumo como el nivel de competencia mediática, así como el interés o no por parte de los mayores en la formación en nuevas tecnologías.

KEYWORDS | PALABRAS CLAVE

Elderly people, technology, population research, digital literacy, social media, Internet, sociology of change.
Personas mayores, tecnología, investigación demográfica, alfabetización digital, redes sociales, Internet, sociología del cambio.

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1. Introduction and explanation of the question

1.1. Older population and new technologies

Nowadays the ageing population is one of the most relevant phenomena in western societies. The proportion of the population aged over 55 is growing. It is estimated that in 2050 32% of the Spanish population will be made up of elderly people, which will make Spain the oldest country in the near future. This fact is due to an increase in life expectancy as a consequence of advances in medicine, improvements in nutrition as well as in education. This data is supported by a decrease in birth rates, especially highlighted by the economic crisis which weighs heavily on the decision to have children (Abad, 2014). The aim of this paper is to provide a renewed focus on new technologies and to verify, through a comparative study in the United Kingdom, France and Spain, how the elderly are adapting to this avalanche of new forms of communication (Santamarina, 2004: 47-76).

Information and communication technologies (hereinafter ICT) open a huge field of possibilities, in dissemination of information as well as in direct capacity connection between emitters and potential audiences (Ferrés, 2000; Castells, 2001; Cornelissen, 2011). Nevertheless, it also includes a series of barriers when used by elderly people (Hamelink, 2000). The recent increase and development of new technologies has not allowed a continuous contact with this group. Moreover, they feel unfamiliar with technology and are not comfortable or prepared for it as they have not received proper training. Quite often a feeling of distrust appears (Suh & Han, 2003). On other occasions the services offered by new technologies are not focused on or applicable to specific uses for people of a particular age. Therefore, we begin with the hypothesis that there is a lack of ICT training for the elderly. Older people must be convinced of the advantages that these services provide (Abad, 2014) and they must acquire the necessary skills to manage the tools that allow them use them (Silva, 2005), including tools for taking care of and improving their health (Choi & Leung, 2008).

1.2. ICT education and learning

The digital society proposes a model in which communication converges through multi screens which provide feedback opportunities that have modified relations between individuals (Aparici, 2011). With the ICT a communication system has emerged where users who participate can take the place of emitters by means of creating content and, in particular, through participation. This participation, together with the inclusion process of the Internet in the homes of the 21st century citizens, and the use of other mobile digital resources has provoked an authentic social revolution (Barroso, 2002). The ICT industry has had to generate new content and modify the way it relates to consumers (González & Monleón, 2013). Citizens are getting used to a new scenario in which they are beginning to have a more important role. Education is essential in this process of change (Prieto, 1999; Cebrián, 2001). Therefore, new mechanisms are needed to provide continuity for teaching and learning and to reach the largest number of people possible, especially those who are older and in need of new abilities, knowledge and digital skills as demonstrated recently in studies by Silva (2005: 51-58) and Santamarina (2004: 47-76). Cognitive processes in the elderly are different in regards to younger people and are determined by personal and social-cultural conditions (Pavón, 2000: 133-139). With the passing of the years, a change takes place in learning processes as well as in the capacity to retain data, which requires that teaching and learning processes of these groups must be adapted to their characteristics (Freixas, 1997).

2. Material and methods

2.1. Applied methodology and justification of the sample

This study addresses the use, knowledge level and competence that the elderly have in France, the United Kingdom and Spain. This research uses the methodological and quantitative tool of the questionnaire because it allows for studying a social phenomenon as a dynamic process and within its real context (Callejo, 2002: 409-422). The survey conducted in French, English and Spanish allows for viewing the study outside of our borders in order to establish comparisons. It is the ideal method to generate propositions that are susceptible on a social level and that can be contrasted and compared through quantifiable data obtained in interviews. To carry out this study a total of 507 surveys were conducted as follows: 172 in France (Toulouse, Nancy and Paris), 160 in the United Kingdom (London, Bristol and Liverpool) and a total of 175 in Spain (Madrid, Barcelona, Castellón, Valencia and Cuenca).

In order for the surveys to have maximum efficiency and credibility, all of the questionnaires were completed in person with the interviewer. Appointments were made in public institutions where the interviewer handed out the questionnaires in person. The questionnaire was previously evaluated by experts and the questions were translated into the lan-

guage of those being interviewed (French, English and Spanish). The answers were cross-analysed and structured data were computed from the groups of questions that were related to the following variables (items):

• Technological gadgets: knowledge level, usage level and usage habits.

• Television watching: type of content, devices and watching habits.

• Social networks: knowledge level, usability, participation and synergies with other devices.

• Internet and buying habits: usability and navigation, purchases, level of web terminology control.

• Information: the media to keep informed, habits of keeping informed.

• Media competence: ICT knowledge level, how they learn and the degree of interest in continuing to learn.

The survey had a total of 20 questions that were separated in accordance to age groups (from 55 to 65, from 66 to 75 and over 75), level of education (no education, primary education, secondary or higher), country of residence (France, United Kingdom or Spain) and gender (masculine or feminine). From the very beginning of this research an attempt was made to apply a quantitative method to be able to extract reflections on the present and future of the ICT in the elderly population. Therefore, the aim was to collect data regarding the perception, consumer habits, concerns and needs of these groups in light of the impact of Internet.

This study addresses the use, knowledge level and competence that the elderly have in France, the United Kingdom and Spain. (...). From the very beginning of this research an attempt was made to apply a quantitative method to be able to extract reflections on the present and future of the ICT in the elderly population. Therefore the aim was to collect data regarding the perception, consumer habits, concerns and needs of these groups in light of the impact of Internet.

3. Analysis and results

The results obtained for the analysis of data extracted from the surveys are presented below and separated by country.

3.1. Results obtained in France

In France, elderly people make up a third of the population, a synonym of a highly ageing country. A large percentage of France's ageing population made up 24.1% of the Internet users in 2014, which equals 11.6 million Internet users. The increase compared to the previous year is between 5% and 7%, but the most surprising fact is that they are the age group that spends the most time on the Internet. The generation of the elderly 3.0, called silver surfers by the marketing companies, are a target audience for the industry because they are increasingly connected and their role is growing as active users. The older generation in France has received the new technologies enthusiastically.

In the technological devices section (knowledge level, usage level and consumption habits), we can highlight that the French elderly are very knowledgeable about new technologies and especially about social networks. All of those interviewed claim to have some type of device to be connected, with the tablet as the most used gadget with 52% followed by a desktop computer and laptop (17%). They mainly use the devices to keep being informed (29%) and connected to their families by sharing photos and videos with them (14%). Entertainment is another one of the reasons they include to explain their use (13%).

Adapting to new technologies is considered a trend and a tendency that the elderly in France are actively participating in. Companies are greatly interested in this dynamic group's training, adaptation and interest in this field. In fact, the communication is appropriate for the type of message that is transmitted. Nevertheless, the results of the survey in France highlight that most (66% of those surveyed) are self-learners in relation to learning and improving their knowledge of ICT. Therefore, older users are willing to adapt and improve their knowledge in this field. The platform that they most commonly use to improve their

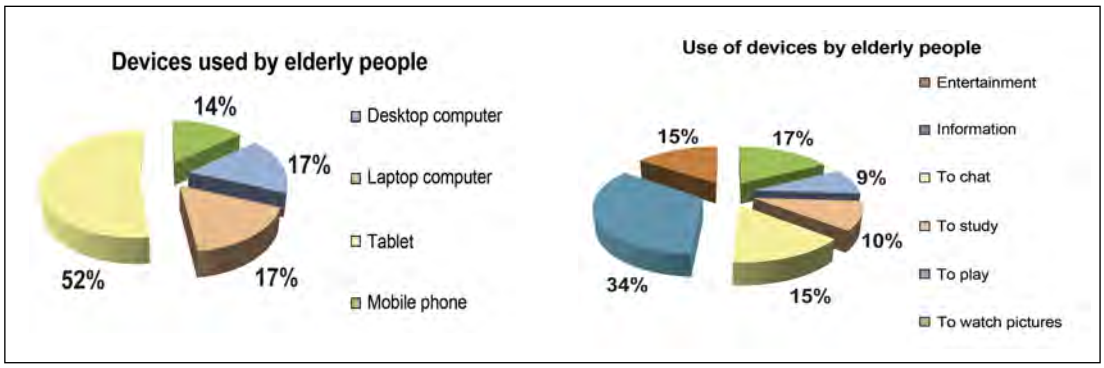

Figure 1. Use of technological devices and main uses in France.

knowledge is with tutorial videos. The mobile applications are also appealing to them but they only use them for personal leisure. The most used application is a video game called Candy Crush. Another result worth highlighting is that age is not the main element that distinguishes between degrees of knowledge in technology, but rather the lifestyle they lead as well as how they live and adapt to technological changes. ICT culture and education are essential so that the ageing population in France do not encounter obstacles for people over 55 years old.

In regards to the item of television viewing, it is worth pointing out that the French elderly continue using television as the main audio visual platform, with entertainment and providing Company as the main reason for said use. Television is still the main medium used to keep being informed (28%) followed by the newspapers (24%) and radio (23%). Most of the French who were surveyed are aware of the concept of «a la carte TV» (85%) and they use it by downloading the programme directly from the television channel (30%) and from their home desktop computer (23%). On the contrary, 83% have never accessed any TV programme via social networks; only 8% have ever done it once with Facebook (50%), the main social network for participation followed by Twitter (33%). In regards to the knowledge level item and usability in social networks in general, we highlight that in France most of those surveyed use Facebook as the main social network (69%) and blogs are another phenomenon that has reached the elderly population in France (20% of those surveyed claimed to have a personal blog). 30% of those surveyed answered that the main activities they do on social networks are sharing photos or videos with friends and family because they think it is a good way to keep in touch with them, followed by looking for profiles in networks of people they are interested in (24%). The next most popular activities are making comments (22%) and modifying and updating their profile (12%).

Finally, the results in relation to usability and navigation on the Internet and purchasing habits are of interest. Most of the French elderly who were surveyed purchase directly on websites (45%); while 32% state that before buying they look for information on the Internet prior to going to the sales site. These data reflect the lifestyle of older people in France and their adaptation to new technologies, especially in regards to the changes in purchasing habits. The Internet links them to the world outside; it is a medium that provides them with an open window to the world and a way of keeping in touch with the French society. In France the ICT knowledge level is very high amongst younger generations, but as we can observe, it is also quite high in the elderly population. Their most common purchases online are transport tickets (train, bus and aeroplane) and food products they purchase weekly on their tablets.

3.2. Results obtained in the United Kingdom

The British elderly have a very active role, especially in new technologies. Faced with higher life expectancy and a better economic situation, many older people have begun to enjoy new forms of leisure, to travel and to have a more active retirement. In this social context, learning and immersion in the world of technology have taken an active role for older people and are quite important in the lifestyle of British society. Specifically, in this study we have found a clear distinction between those surveyed between the age of 55 to 65 and those between 65 and 75. In regards to the first item about knowledge, use and habits of technological device usage, those surveyed between 55 and 65 have a high level of knowledge of terminology. The concept of streaming is the least known by those interviewed (only 5% knew this term),

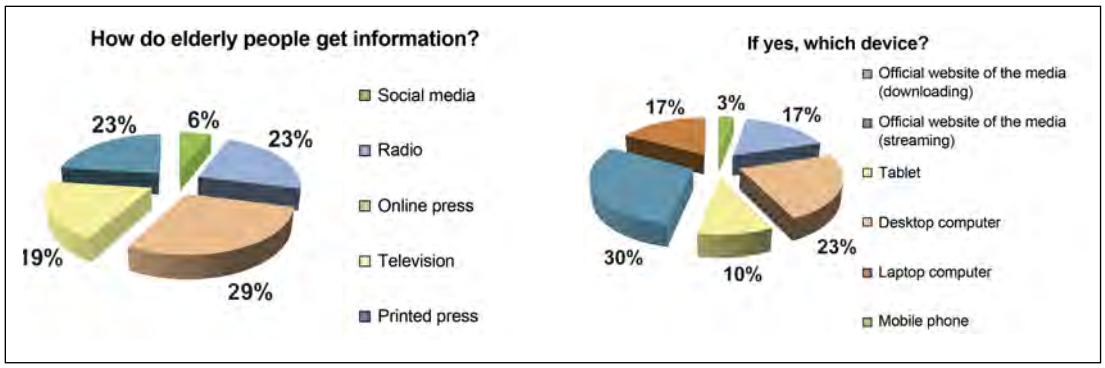

Figure 2. Mass media and main platform for getting news in France.

followed by the term hashtag (9%). Most are familiar with a la carte TV or on demand TV (23%) and Apps (18%). These data show the relation with data obtained in France where the knowledge of these terms was lower.

The most used device is the mobile telephone (60%), followed by the tablet (30%), while those in the 65+ age group use the desktop computer more often (85%) in comparison with other devices. Both groups confirm that they use them mainly due to their convenience (65%) and habit (32%). In the United Kingdom, as in France, there is an important trend in regards to adaptation of the elderly to new technology. There is a high level of interest to learn and improve in this field, especially because most British people are aware of their needs, their surroundings and the potential of new technologies to improve their living conditions. The need to feel independent is the main incentive for this increase in using and consuming technology in the UK. That is the reason we understand that for the 55 to 65 age group, studying is the main use of ICT (54%).

On the contrary, in people over 65, the main use is still the need to keep being informed (24%) and entertainment (22%). Moreover and as is the case in France, despite the high interest and degree of adaptation of this profile with ICT, most of those surveyed are self-learners (69%) or learn through the help of a family member (22%), with tutorials being the most used platform for self-learning amongst those between the ages of 55 and 65 (72%). On the contrary, those older than 65 learn by attending conferences and specialized courses.

We can therefore observe that in this country there are ICT training courses for this audience. Mobile applications are commonly used amongst the British elderly, most of those surveyed had more than one application downloaded on their devices (71%) with apps related to gambling being the most used (32%), followed by games (27%), specific purchasing apps (21%), Facebook (11%), Google Maps (6%) and PayPal (3%). The use of email is very popular amongst the British population (92% claim to have an email account), but the most interesting piece of data is related to how it is used: 72% use it to send and receive emails but 28% use it for promotions for product brands.

In regards to viewing TV, as in France, the traditional TV set is still used for audio visual consumption (70%). As far as other screens are concerned, the mobile phone is also used, but at a much lower rate (16%) and always in their free time, although the time frame when they most use this device is in the mornings. TV is still the most used medium for keeping informed (27%), but traditional press (26%) and online press (24%) follow closely for keeping informed. Most elderly British people know and have used at least once a la carte TV (92%), by downloading the content from the web page of the TV channel (42%), watching in their free time (72%) and from the desktop computer at home (33%).

The British elderly who were surveyed, in contrast to the French, have at times participated in audio visual content through social media (26%), with Facebook (46%) and Twitter (42%) being the two biggest social networks in which they have participated with live comments.

In regards to the knowledge and usability item in social networks in general, most of those interviewed use Facebook as their main social network (46%), followed by Twitter (39%). Blogs are also used by the British elderly (15%), also stating that besides having a personal blog, they like to look for opinions in other blogs and forums. The main activities they carry out in social networks are sharing photos and videos with friends and family (32%), followed by writing com-

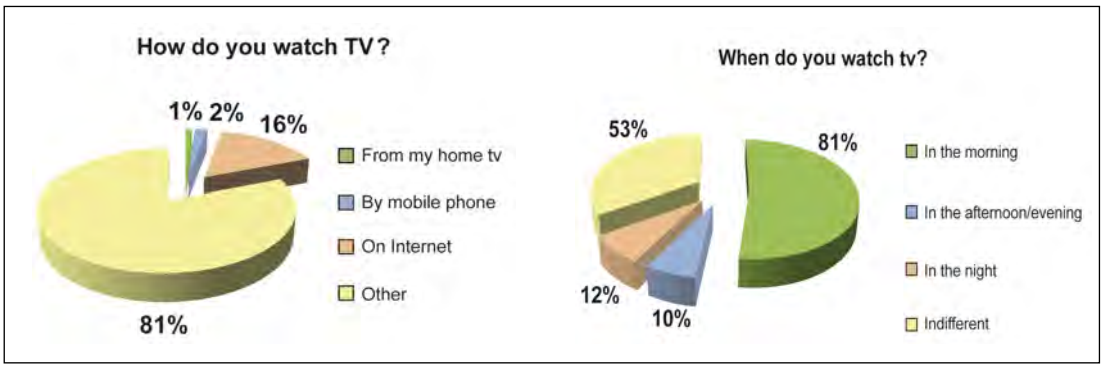

Figure 3. Television consumer use and habits in the United Kingdom.

ments (29%) and looking for profiles of other people who share their same interests (16%) because they consider the social networks as a way to connect and meet other people in the same age group.

Lastly, it is worth pointing out the results related to usability and navigation in Internet and purchasing habits where we again find differences according to the age groups of those surveyed. Many of those surveyed between 55 and 65 purchase directly on Internet (42%), or check first online to look for information and then physically go to a shop to buy the product/ service (39%). This highlights the predisposition of the British society to access the Internet at the beginning of the purchasing process. On the other hand, those surveyed over 65 look for information on the Internet and then go to the point of sale (39%) or only compare prices and buy products in the same shop (37%). They are also aware of price differences, which is why 28% ask a family member to help them look for and compare online first and then inform them.

3.3. Results obtained in Spain

The use of the Internet is integrated in a large part of Spanish society (Gabardo, 2014: 41). There is still a long way to go to insert those Spanish users, who due to issues related to age, are still reluctant to engage with the digital world (De Andrés y Lima, 2014: 189-197). According to information from October 2013 to May 2014 of the General Media Study (EGM in Spanish), the problem of the older population is located between the ages of 55 and 64; a group that has the necessary devices for most occasions, but does not know how to make the most of them because they are at the beginner level as users of ICT. Those older than 65 are in a worse situation; their low current penetration rate (less than 30%) is difficult to reverse and hopelessly condemns this group to digital illiteracy and exclusion. Lower to mid-lower class elderly have some barriers to overcome in order to completely enter the digital society, especially those older than 55. Moreover, the economic crisis has caused this segment to miss the opportunity they had to directly adapt to the Internet. Their growth levels as users have been slower than other social strata. The crisis that has hit Spain hard can easily be seen in the communication sector (Cabezuelo-Lorenzo, 2013: 703-7015).

In regards to knowledge, use and consumer habits in technological devices, those surveyed in Spain between 55 and 65 years old have a high level of knowledge regarding a la carte TV or TV on demand

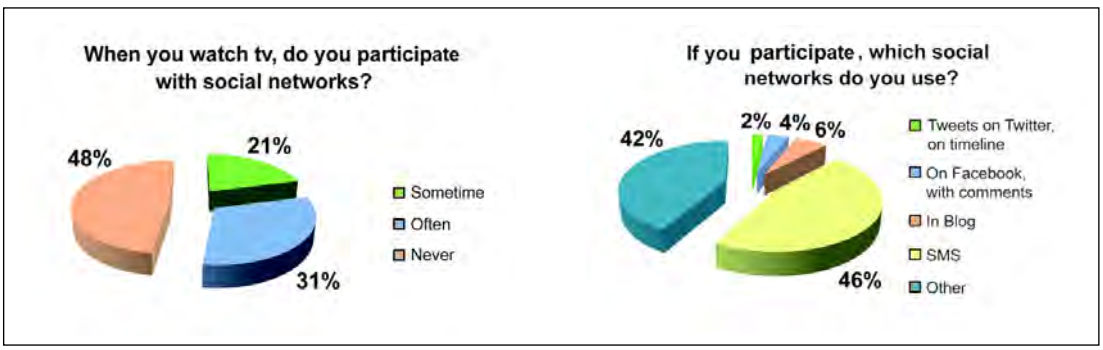

Figure 4. Level of participation of television content through social networks in the United Kingdom.

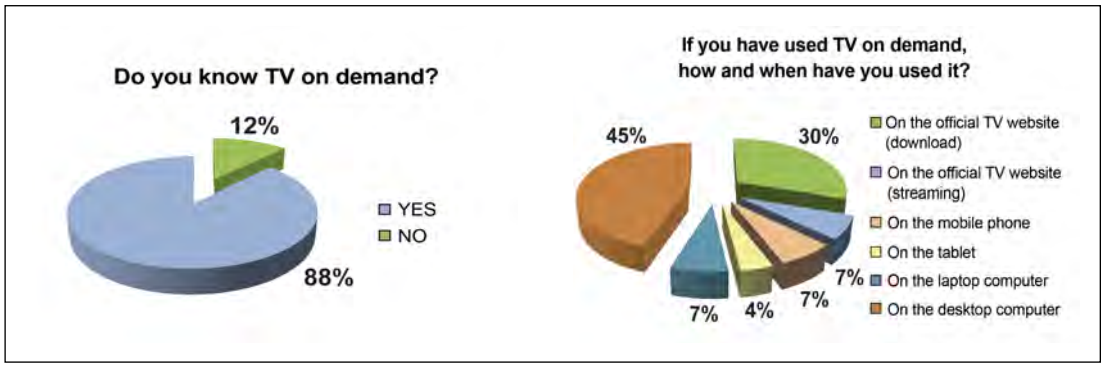

Figure 5. Knowledge and use of a la carte television in Spain.

(63%), Internet (33%), tablet (21%), WhatsApp (20%) and Facebook (19%), with concepts such as website (8%), hashtag (6%) and streaming (3%) the most unknown. There is little knowledge in Spain about the concept «a la carte TV» (12%). Those familiar with the term have sometimes used it by means of downloading audio visual content and from the TV channel's web page. When they are told what a la carte TV is and what advantages it offers, 72% stated they would like their television set to offer them programmes in accordance with their interests and with the possibility of consuming content when they wanted.

The most used technological device is the mobile phone (81%), which is used most due to its convenience (62%) and habit (32%) and at different times (71%). The Spanish mainly use this device to keep being informed and to keep in touch (69%), for entertainment (18%) and to talk (10%). Only 2% claimed to have used it for education or training.

This is a result that contrasts with the data obtained in France and in the United Kingdom, since we observe that in Spain there is not high adaptation to new technologies and the elderly are unaware of the actual possibilities. The elderly in Spain primarily learn about new technologies from family members and friends (61%) followed by self-learning (26%) and only 13% have attended a course as a way of learning about new technologies.

On the contrary, Spaniards are very interested in learning about new technologies (87% want training and only 13% don't) through classroom courses (62%) and specific conferences about this subject and in accordance with their needs (38%). They demand more specifically designed education for them because they need a more basic language to understand. Training for the Spanish elderly must adapt to their profile and learning limitations/capacities. Applications are not widely used by Spanish elderly, only 15% said they had apps on their devices, amongst which were those related to the news (8%), games (5%) and online banking (2%). The use of email in Spain is quite high (63%) and their main uses are to receive mail (51%) and to send mail (44%). Only 3% said they had used it to participate in contests and promotions and only 2% claimed to use it for trends and fashion.

With regard to television viewing, Spaniards use the traditional platform for watching TV (85%). Amongst other possible screens for consumption they also use the desktop computer (8%) and the tablet (4%), while only 3% watch TV on their mobile phones. TV viewing in Spain mainly takes place at home and most Spanish elderly watch TV at night (55%), 25% in the mornings and 20% in the afternoon. The main media used by Spaniards to keep informed are TV (40%), newspapers (30%) and radio (20%). Only 10% claimed to keep being informed on the Internet. This result contrasts with those obtained, especially, in the United Kingdom. The elderly population in Spain uses online media much less than their British counterparts to keep informed due to their lack of confidence in online news.

Spaniards, quite like the French, have low participation rates in media content on social networks, but in Spain it's even less. 85% of Spanish elderly state they have never participated, 14% have participated sometimes and only 1% claim to participate online regularly. Of the few who have participated, most of them have done it on Facebook (71%), text messages (15%), blogs (10%) and Twitter (4%).

Those that have never participated with comments online justify their lack of participation due to lack of knowledge (81%) and only 19% say they are familiar with this option but do not know how to do it. In regards to the item regarding level of knowledge and usability in social networks in general, Spanish older people do not consider themselves as users of social networks (82%), only 3% consider themselves as users and 15% at some time. They do not have basic

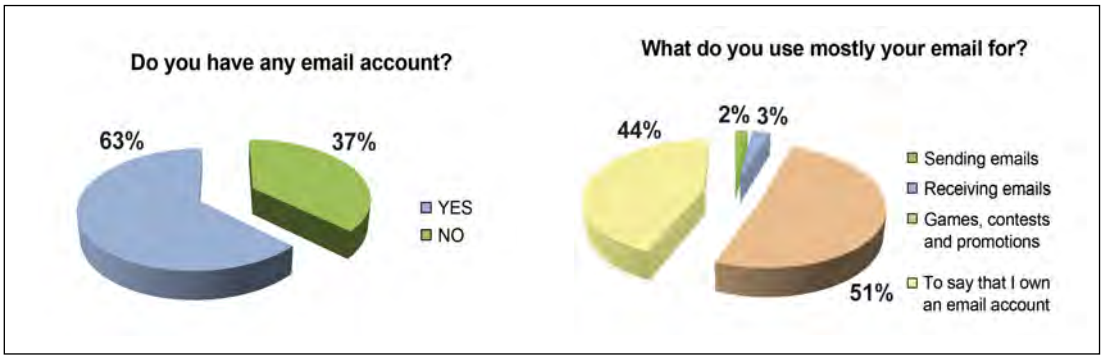

Figure 6. Use of email by the elderly in Spain.

knowledge about existing social networks; most are familiar with Facebook (75%), a blog (15%) and Twitter (10%), and they are not aware of what an online community is or other types of social media. They say they are familiar with them because of television, the news and their family members, especially the younger ones.

They always use them in their free time and the activities they point out coincide with those of the French and the British: sharing photos and videos with friends and family members is the most common (54%), followed by writing comments (25%) and looking for profiles of people similar to them or with similar interests (21%). It is worth mentioning that none of those surveyed use social networks to participate in contests or to follow a brand, which they justify by saying they don't understand the purpose. Other studies, like Sotelo (2012: 217-230), have pointed out, nevertheless, that in the case of Spain there is a strong alliance between social networks and sports information, especially football.

In regards to usability, navigation on the Internet and purchasing habits there are not big differences related to age groups. In general, most Spaniards physically go to the shop to make their purchases (74%) and only 9% look for information online before going to the point of sale. 10% said that sometimes, and depending on the type of product (especially technological ones), they had a family member do it for them. Only 6% said that advertising helps them choose products/services and most of them were unfamiliar with specific online sales sites (88%). We can therefore observe that in Spain electronic commerce is underdeveloped amongst the ageing population and they are a target audience that is not reached by advertising messages since they are not familiar with this type of online activity and they particularly distrust the Internet as a way to make purchases. The price is not a relevant factor that changes their behaviour in regards to buying online.

4. Discussion and conclusions

As a result of the results obtained in the three countries, it can be established that the elderly population in Spain has the lowest adaptation in regards to new technologies and that this is mainly due to the lack of training and education in the field of ICT. These results are encouraging for new start-ups aimed at this specific group with methodologies adapted to their needs, capacities and limitations. Our elderly have concerns, which must be answered, especially if we want to attain the same level of certification as other European countries.

The technology industry must offer a wide range of products and services adapted to the needs of our elderly that allow for easy adaptation, use and application. Priority attention is necessary for our elderly so they can gain autonomy and be able to look for information (search, choose, elaborate and share) by themselves in the new digital society. This involves acceptance of cultural, political, ideological and economic implications of this new era so closely linked to technology.

There have been previous success stories in education that have allowed different groups to remain active and integrated in society during their lifetime. Now it is necessary to reinforce those programmes with different transformations through continuous education programmes for the elderly. It is essential to create required mechanisms so information is really permanent and continuous in the current knowledge and information society in order to reach the greatest number of people.

As active actors in our society, the elderly constantly make new demands that must be satisfied and included in our system. All educational institutions, especially those closely linked to research, as is the case of the university, must adapt their content and expand their curricula in order to train future professionals adequately in fields that respond to the needs of our older citizens.

The elderly in France and in the United Kingdom, although they can improve their skills and knowledge in relation to ICT, are seen as an interesting market niche for various sectors as they make up a large sector from the quantitative point of view, from a political point of view (due to their important voting capacity) and they are interesting human capital (because of their knowledge and experiences). Nevertheless, in Spain they are not always seen as an opportunity and on many occasions they are excluded from new technologies. The Spanish elderly need greater motivation to learn. This lack of motivation changes when they discover that ICT can notably change their quality of life.

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Internet and the Elderly: Enhancing Active Ageing

Mayores e Internet: La Red como fuente de oportunidades para un envejecimiento activo

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ABSTRACT

Global ageing has led European and international organizations to develop programs for active ageing, in order to reconstruct the role of the elderly in society. Active ageing includes social communication aspects which have been the subject of less research than other more pressing ones linked to physical and economic characteristics. This research is centered on these communication variables; it addresses the link between the elderly and Internet, and has two main objectives: To discover how useful Internet is for this age group, and to explain the potential this medium has for active ageing. To do so, a qualitative methodology is used based on three discussion groups, each made up of five or six people between the ages of 56 and 81, led by an expert moderator. The results of the qualitative content analysis of each discussion indicate that the Internet is a source of opportunities for the elderly, and this potential may be divided into four categories: Information, communication, transactions and administration, together with leisure and entertainment. This potential improves the quality of life for the elderly and contributes to their active ageing. However, to maximize this, e-inclusion programs and methodologies are needed to make the Internet user-friendlier for the elderly and provide them with training in digital skills.

RESUMEN

El progresivo envejecimiento de las sociedades ha llevado a los organismos internacionales y europeos a desarrollar programas de envejecimiento activo, capaces de construir una nueva cultura sobre el papel de las personas mayores en la sociedad. Estos incluyen aspectos sociales de carácter comunicacional que, sin embargo, han tenido menos desarrollo investigador que otros más apremiantes, vinculados a aspectos físicos y económicos. Esta investigación atiende precisamente a estas variables comunicacionales, abordando la vinculación de los mayores con Internet y planteándose dos objetivos principales: Conocer las utilidades que tiene Internet para este colectivo y explicar los motivos que convertirían a este medio en una fuente de oportunidades para un envejecimiento activo. Para satisfacerlos, se utiliza una metodología cualitativa que se apoya en el desarrollo de tres grupos de discusión constituidos por cinco y seis personas de 56 a 81 años y moderados por un experto. Los resultados obtenidos del análisis cualitativo del contenido en cada discusión indican que Internet es una fuente de oportunidades para los mayores, que pueden aglutinarse en cuatro categorías: Informativas, comunicativas, transaccionales y administrativas, y de ocio y entretenimiento. Estas oportunidades optimizan la calidad de vida de los mayores y contribuyen a su envejecimiento activo, si bien, su máximo aprovechamiento precisa de programas de «e-inclusion» y metodologías que aproximen Internet a los mayores, facilitándoles una formación en competencias digitales.

KEYWORDS | PALABRAS CLAVE

Internet, the elderly, active ageing, cognitive stimulation, digital divide, digital literacy, ICT, healthy living.
Internet, personas mayores, envejecimiento activo, estimulación cognitiva, brecha digital, alfabetización digital, TIC, vida saludable.

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1. Introduction and state of the question

According to a recent UN report (2014), in 2050, Spain will become the third «oldest» country in the world, with 34.5% of its population over the age of 65 (Aunión, 2014). The 2012 Eurobarometer states that, depending on the European Union country, the concept of what 'elderly' means is very different, but, on average, anyone over the age of 63.9 is considered «elderly» (TNS Opinion & Social, 2012). In view of this progressive ageing of the population, «the challenge in the 21st century is to delay the onset of disability and ensure optimal quality of life for older people» (WHO, 2001: 3). Thus, during the 1980s, the European Union began to develop a new policy on ageing, which meant moving from a passive attitude to a more proactive one among the elderly. This new approach allows for greater well-being of older people and contributes to the economic sustainability of the social protection systems in the European Union, and thus can unify the interests of all stakeholders (citizens, NGOs, business interests and policy makers) (Walker, 2009).

Active ageing was defined by the WHO (2002: 79) as «the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age». This concept is linked to both physical and social and mental well-being, and also refers to the participation and integration of old people in society (WHO, 2002; OMS, 2002).

From a psychological perspective, the work of Fernández-Ballesteros et al. (2010) shows the criteria and predictors for what they call «successful ageing», which spring from the three variables with which Rowe and Khan (1987, 1997) characterized the opportunities of ageing: «Usual», «pathological» and «successful». In this study, based on the ESAP (European Survey on Aging Protocol) and its PELEA version (Protocol for the Longitudinal Study of Active Ageing), social and participative engagement was identified as one of the aspects of «successful ageing». It is on this point that this work is based and it is also the point which has inspired the least research in comparison with other more urgent aspects linked to health or economics.

The European Union (2011) declared the year 2012 as the «European Year for Active Ageing and Solidarity between Generations» in order to combat the effect of demographic ageing on the social models of the member states, and to promote the creation of an active ageing culture as a permanent process in a multi-age society.

Since the 1990s, the European Commission has developed programs intended to tackle this new challenge, by building initiatives which lead to greater levels of independence and integration of the older age group. Within these programs, communication has been considered a key element for the development of active ageing. Nevertheless, in spite of its importance, Nussbaum and Coupland (2008) consider that communication is not yet a core concept in studies on ageing.

However, there is no doubt that ICT can offer new possibilities for the elderly. For this reason the R&D Report on ageing underlines the need to encourage research into technological aspects to combat the effects of human ageing (Parapar & al., 2010).

It has been proven that it is precisely in old age that ICT offer relevant opportunities for the improvement of psychological processes (Aldana, García-Gómez & Jacobo, 2012; Elosua, 2010), social aspects (Martínez-Rodríguez, Díaz-Pérez & Sánchez-Caballero, 2006), and issues that are clearly related to dependency (Del-Arco & San-Segundo, 2011; Malanowski, Özcivelek & Cabrera, 2008). Ala-Mutka et al. (2008) suggest various policies with a holistic focus in order to improve the quality of life of the elderly through a process of permanent training, based on ICT, in which the involvement of the institutions and younger generations is essential. It also seems crucial that such methodologies should include instruments for the assessment of the media competences of the elderly (Tirado & al., 2012). However, it seems complicated to decide with certainty if ICT can improve the quality of life for the elderly, as there are three variables which are decisive in measuring this impact: Wealth, health, and social relations (Gilhooly, Gilhooly & Jones, 2009).

In this context, Internet appears to offer great support for active ageing, and should be taken into account in the development of active ageing policies in present-day and future societies. It has been predicted that the percentage of older Internet users will grow in the next few years; but this growth will presumably be slow due to the difficulties of access this group has because of its low level of education (lower than secondary-education) (Fundación Vodafone, 2012). In spite of this, the general spread of web accessibility and the abundance of devices that enable mobile access have provided new ways of improving the quality of life. But the undeniable potential offered by the Internet to other younger groups appears to be limited in the case of the elderly. The digital divide is more evident between these two collectives in modern societies. On this point, the elderly make up a group who are at risk of exclusion –or of isolation– (Querol, 2012; Fernández-García, 2011). ICT can counteract

this, by promoting the collaboration and development of learning communities who will overcome physical limitations (Shepherd & Aagard, 2011), and by offering them an opportunity for social integration and healthy orientation (Agudo, Fombona & Pascual, 2013).

This divide between the young and the old generations, brought about by discrimination in access to ICT, has become one of the great challenges for the UN and the European Commission. Thus, during the «World Summit on the Information Society», organized by the United Nations International Telecommunications Union in Geneva (2003) and in Tunisia (2005), a commitment was declared to those groups who are at risk of marginalization (UN, 2003). Regarding the same concern, the European Commission has carried out several initiatives, outstanding amongst which is «i2010», which intends to promote accessibility and ensure that all groups will learn basic digital skills (European Commission, 2005). A year later, «e-inclusion» is considered a key element in achieving integration of ICT and their use in people's lives in order to guarantee their participation in the information society, to reduce the digital divide and to promote better quality of life and social cohesion (European Commission, 2006). The «e-inclusion» policies should focus on helping the most excluded individuals to use ICT productively (European Commission, 2007). On this point, the European Union Digital Agenda 2020 aims to make the most of the potential of ICT «to respond to the needs of an ageing population» and so to contribute to active ageing (Directorate-General for Employment, Social Affairs and Inclusion, 2012: 18). At present, one of the aims regarding the use of ICT in order to achieve independent living for the elderly is to reduce their need for assistance (Bubbolini, 2014).

As we have indicated, despite the fact that recent studies show that social aspects such as communication have been identified as an important part of active ageing, there has been less research on this subject in comparison with other more pressing issues. This piece of research focuses precisely on this type of communication variables and tackles two essential objectives:

a) Awareness of the multiple uses of the Internet for the elderly.

b) Explanation of the reasons that make this medium a source of opportunities for active ageing.

2. Material and method

The methodological design responds to a qualitative typology. The discussion group was considered, in this case, as the most suitable qualitative tool, because it admits more in-depth explanation, which will allow us to discover the potential of the Internet.

Thus, a model was designed to gather first-hand data on the experiences of older people with Internet. This design is based on three discussion groups, guided and moderated by an expert, and the later qualitative analysis of the content expressed in each discussion.

The members of the sample were chosen in accordance with the following criteria: Internet users of both sexes, aged between 56 and 81, belonging to the middle class, with different education levels, who reside in urban areas of different sizes and show a clear interest in an active life (they are all linked through being involved in continuous education programmes). In this way, sufficient heterogeneity was achieved to guarantee greater wealth and variety in the opinions expressed.

The procedure followed by the moderators was to interfere as little as possible, with the help of a position statement which gives the major points to be dealt with in the group, but also to help the participants to freely express the use they make of the Internet as a means to improve their everyday habits, and to optimize their quality of life.

The length of each group discussion varied, which is why the Group Z conversation was shorter. The conversation was guided but not conditioned by the moderator

The group discussions were recorded and transcribed, thus permitting a qualitative analysis of the contents which has allowed us to identify relevant aspects in the participants' experiences regarding the proposed objectives. Such analysis is focused on the corpus of textual data resulting from the transcription of speech, together with the description and interpretation of same in order to, later, establish the possibility categories offered by the Internet for active ageing. This taxonomy responds to a subject criterion in accordance with units of content which were defined «by taking

Table 1. Fact sheet for group X

MEMBERS	4 women and 2 men
AGE	Between 63 and 70
RESIDENCE	Guadalajara (Castilla La Mancha)
PROFILE[1]	Lower grade managers and professionals Lower grade supervisors and technicians
OCCUPATION	All retired
LINK	Classmates (Guadalajara Adult Education School)
TIME	01:00:43

as units those fragments that express an idea referred to a topic» (Gil, García & Rodríguez, 1994: 192).

3. Results

The experiences narrated by the participants in the three discussion groups have shown some concurrence in considering the Internet to be a source of opportunities to optimize their habits for living and to contribute to their active ageing.

The richest results were obtained from the experiences from group X and group Y; those of group Z were less productive. These data have been classified into four categories of opportunities, according to the results of the consensus detected in the analysis of the discourse. As it has been explained, this classification corresponds to a subject criterion which permitted its own nomenclature at a later stage. Moreover, isolated quotes from some of the participants have been incorporated as they reflect a consensus on the opportunities which the Internet offers them.

Table 2. Fact sheet for group Y

MEMBERS	3 women and 3 men
AGE	Between 55 and 70
RESIDENCE	Paracuellos del Jarama (Madrid)
PROFILE[1]	Lower grade managers and professionals Lower grade supervisors and technicians
OCCUPATION	All retired
LINK	Classmates (Paracuellos de Jarama Adult School)
TIME	01:17:21

Table 3. Fact sheet for group Z

MEMBERS	5 women
AGE	Between 56 and 81
RESIDENCIA	Madrid (Madrid)
PROFILE[1]	Non-skilled worker
OCCUPATION	All but one retired (one unemployed)
VINCULACIÓN	Classmates (Language Academy in Chamberí)
TIME	00:28:59

3.1. Information opportunities

For the elderly the Internet has become a magnificent source of information. It is a large encyclopedia, dynamic, comfortable and easily accessible, which allows them to find information on multiple subjects: «I consult Internet a lot, for anything and everything» (group X, 2014).

Google is the only search engine used by the participants in the different groups and the resource through which they access other information sites which are of interest to them. However, they admit to not using other types of information platforms such as blogs and forums.

The recurring topics for consultation found in the discourse analysis of the groups can be classified into the following areas:

a) Current affairs: This age-group shows special interest in the news that affects the areas in which they are involved (province, town, country) and some of them confess a preference for digital press rather than the traditional one.

b) Health issues: Interest in this type of information is widespread among the participants in all the discussion groups. Nevertheless, they always look for information which affects them more or less directly: «If this hadn't happened to me, I wouldn't look it up on Google» (group Y, 2014). In general, they look for data on:

- Illnesses. In this case, they always trust the diagnosis of the healthcare professional and are simply interested in natural remedies or want to find out more or better understand the information offered by the physician, but always keep in mind that «Internet can never take the place of a doctor » (group Y, 2014).
- Doctors. On this point, they look for information about the professionals who are going to treat them and/or members of their families and/or friends.
- Hospitals. They are interested in the quality of the centers in which they are treated: «I always get into information about the hospital, about the prizes they have been given, the awards they have received; that is the prestige of the hospital» (group X, 2014).
- Healthy diets. For them Internet is a source of information on healthy habits, although they consider that diets usually change.

c) Culture and general interest topics: This age group, particularly the women, frequently use the web to find recipes. They often look for information about things that intrigue them, for example: «When there is a word that doesn't sound familiar, Wikipedia or a country. I mean, the information on Wiki, it's just sensational» (group Y, 2014). Even to resolve one-off technical problems: «Well, any question that arises or that I don't know, technical information, anything there is» (group X, 2014). Regarding culture, they also look for information on exhibitions, travel, theatre and other activities related with their leisure and entertainment.

An important aspect that affects the information opportunities offered by Internet refers to the reliability

of the data. On this point, the participants are wary: «I don't believe everything they say […] There are a lot of smart asses» (group X, 2014). Therefore, they realize that Internet: «It is not the panacea. There is a lot of rubbish too» (group Y, 2014). For this reason, they stress the importance of verifying the information and finding it in reliable sources. Apart from the reliability of the source of information, there are other variables which influence their feeling of more or less confidence in the data, such as the design and appearance of the website or the prestige of said platform.

Particularly for health information, they are especially cautious and express warnings on moderation in the use of the Internet for access to this type of data, so as not to become hypochondriacs: «You make your life a disease» (group Z, 2014).

3.2. Communication opportunities

Within the communication opportunities offered by the Internet, the one most used by the participants in the research is email. Several members of the groups consider that smartphones have made communication easier, offering more immediate connection to email or the social networks. They have concentrate the use of the computer to those personal interactions to which they prefer to devote most time, such as communication with family members who live abroad, using platforms like Skype: «The computer, well I use it for Skype, if I'm talking to Manuela [her daughter]» (group Y, 2014).

Moreover, the increase in mobile devices has, amongst this group, promoted the possibility of communicating by means of social networks such as WhatsApp and Facebook. As is common amongst other age groups, WhatsApp has replaced traditional telephone communications: «WhatsApp, right, I've stopped using the telephone» (group X, 2014). On the other hand, Facebook is seen as a means of interaction with friends and family members, less immediate than WhatsApp, but more enjoyable for many of the participants, as it allows them to share experiences: «Well, my daughters sent me photos of my grandchildren» (group Z, 2014). Belonging to Facebook is determined by a link of friendship or a family relationship with other people who belong to it. This fact and the feeling that attending to several social profiles is a waste of time are variables which explain why they do not belong to other networks such as Twitter. Those with a negative opinion on social networks prefer not to spend time on them: «But as for Facebook, if you really want to know what I believe, I think it's a lot of rubbish» (group X, 2014).

In general, the communication opportunities offered by the web facilitate social interaction which involves the elderly in relationships that strengthen their social abilities and keep isolation away; these are effects that improves their motivation, self-esteem and satisfaction. Additionally, making the most of these opportunities causes admiration amongst their peers: «I'm very pleased to say that on WhatsApp the person I send most messages to is a gentleman of 93» (group X, 2014).

3.3. Transactional and administrative opportunities

Internet has made certain everyday habits easier for older people, due to the possibilities it offers to carry out «online» transactions and administrative processes. On this point Miranda (2004) states that these operations are particularly useful for those people who have limited mobility because of health problems. Thus the elderly may feel that these possibilities are very beneficial and convenient.

The members of the groups habitually use the web for their income tax returns or to manage bills and bank accounts: «I, for example, for the natural gas bills, the telephone bills and everything, everything, I do it on Internet, and bank on Internet, except for withdrawing money because I don't let me» (group Z, 2014). They also use it frequently to ask for appointments (to see the doctor or for bureaucratic processes), and emphasize its convenience and immediacy compared to other ways of doing so, such as going to the centre or telephoning.

Regarding «online» shopping, its use is not found to be very widespread although some people use it to organize travel, to buy tickets for the cinema or the theatre, etc. Only one participant showed interest in buying products «online»: «I really like getting into buying and selling. I buy things from abroad […] things I need that are more expensive in Spain» (group X, 2014).

3.4. Leisure and entertainment opportunities

Apart from facilitating information on leisure and entertainment, the Internet offers direct entertainment consumption, although these possibilities are the least exploited by this group. In this regard, some members of the discussion groups confess that they consume radio and television programs online, generally because they have missed the live broadcast; this is the most «widespread online» leisure consumption amongst the participants in the study.

A member of the group says: «Well, I do use it […] also to play sudokus, to tell you the truth, I play to sharpen up my brain a little» (group X, 2014). In this

way, he shows his interest in promoting his cognitive activity.

Another member of a different group confesses that he uses Spotify to consume «online» music, although its use cannot be considered widespread amongst the old people who make up said groups.

4. Discussion and conclusions

The results of the study carried out show that the elderly are becoming more and more interested in the Internet and technological devices; and are beginning to make them part of their lives as they have discovered the possibilities they offer, which they explain in their discussions.

In the specific case of the Internet, which is the focus of this research, the results are in accordance with the ideas of Juncos, Pereiro & Facal (2006), who conclude that the Internet is a new window onto the world which facilitates communication and cognitive activity for the elderly, by contributing to their greater autonomy and satisfying their demand for «space and a social voice» (IMSERSO, 2013: 16). The elderly make use of quite a few opportunities offered by the web, particularly for information and communication; but they are also beginning, in their day-to-day life, to use other possibilities for administrative processes and entertainment.

The information options are the most utilized by the elderly and promote greater autonomy of knowledge, thus improving their well-being by contributing to the implementation of their skills, broadening their knowledge and increasing their self-esteem. As Miranda (2004) declares, in general, the elderly are interested in similar topics to those which interest most of the population, but they also consult information that is relevant to their time of life. Consequently, current affairs and health are the key focuses in their searches. However, the elderly are cautious and try to use trustworthy sources. The National Telecommunications and Information Society Observatory (ONTSI) (2012) identifies uncertainty on the reliability of information (54.4%) and the risk of misinterpretation of same (28.7%) as the two main obstacles in the search of healthcare information by older people.

In general, the communication opportunities offered by the web facilitate social interaction that integrates the elderly into relationships that strengthen their social qualities and keep them out of danger of isolation; these effects favor their motivation and satisfaction. The elderly use the web to communicate by means of email and other types of «online» interaction which are adapted to mobility, such as WhatsApp or Facebook. In this sense, the communication facilities offered by the Internet contribute to their social integration with peer groups and with their family members, which is essential to guarantee active ageing (Agudo, Pascual & Fombona, 2012).

As regards the transactional and administrative opportunities offered by the Internet, it may be concluded that they speed up the development of elderly people's everyday activities, involving them in a more dynamic environment. In addition, the Internet allows them to carry out actions that some of them would not be able to do because of physical impediments, thus contributing to their greater independence. Although Agudo, Pascual & Fombona (2012: 199) suggested that administrative processes were not very common amongst the elderly, this tendency is undergoing change.

Finally, the elderly define the potential for entertainment and leisure offered by the Internet as a playmate that contributes to their physical and psychosocial well-being (Blat, Arcos & Sayago, 2012). From this perspective, the Internet opens the doors to autotelic leisure in its ludic and creative dimensions (Cuenca, 1995), «in which freedom of choice, of expression and the development of non-utilitarian tasks prevail» (Goytia & Lázaro, 2007: 5). These possibilities, however, are not the most appreciated by the elderly, although they improve their cognitive activity and facilitate a positive attitude which strengthens their self-esteem.

Therefore, it can be concluded that the Internet is a source of opportunities for active ageing, as it has possibilities that optimize the quality of life of many different types of elderly people in its psychological dimension and also from a holistic perspective.

Among the limitations of the research we must mention that, although the methodology permits us to achieve the main objectives, allowing for a thorough and direct explanation of the establishment of the Internet as a source of opportunities for active ageing, some interesting questions demand additional treatment, as they are proposed as a first approach and require further in-depth study.

Thanks to our varied sample, we have found that elderly people with different levels of education and cognitive capacities «actively demand and make the most of learning from new technologies» (Requena, Pastrana & Salto, 2012: 17). For this reason, the encouragement of digital literacy amongst the elderly is of capital importance. They themselves demand training to facilitate this learning, and more accessible tools, as they are aware of the great opportunities offe-

red by the web. Fernández-Campomanes & Fueyo (2014) consider that these training programs should be developed taking into account gender factors which will promote the participation of women in society from an empowering and not merely instrumental perspective. Regardless of gender, according to Macías-González & Manresa (2013), those older people who have had prior contact with ICT feel greater motivation to learn more about the subject and see these technologies as a helpful tool. Whatever the case, one of the main objectives which should be considered in this digital literacy program is to offer the elderly «a full and more participative life» in which ICT would be instruments that foster their civic participation (Abad, 2014: 179).

In a changing and technologically advanced world, lifelong learning is fundamental to avoid exclusion and to guarantee adaptation to the norm (Jiménez, 2011). This fact offers an interesting field for reflection for civic and institutional leaders, who should sponsor the development of policies to facilitate access to ICT and proper use by the collective studied. Such policies are what will promote and consolidate a change in our way of understanding and perceiving ageing, as a response to the legitimate rights of participation of the elderly. Hence, it is essential to optimize «e-inclusion» programs and to support the development of methodologies that will bring the Internet closer to older people by offering them training in skills which will allow them to exploit the potential offered by the Internet for active ageing to which this work has referred.

Notes

[1] Profiles classified following the European Socio-economic Classification (http://goo.gl/krmKrL).

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Active Ageing and Access to Technology: An Evolving Empirical Study

Envejecimiento activo y acceso a las tecnologías: Un estudio empírico evolutivo

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ABSTRACT

Researchers' interest in seeing the benefits of Internet in elderly people is now growing. The network helps this group to increase communication, avoid isolation and loneliness and to age actively. Europe decided 2012 to be the Year of Active ageing. This paper presents a descriptive study of time series analysis carried out between 2004 and 2012 with the aim of knowing how the evolution in the level, motives and needs of the use of computers and Internet by elderly people in an environment of university training focused on health and life quality is. To obtain results a question paper is to be handed out to a sample of 419 people aged between 55 and 94 and taking part in the «Inter-university Programs of Experiences» from the University of Burgos. The obtained results match up with previous studies that pointed a noticeable increase in the use of the Internet (in frequency, number of users and resources) caused by elderly people's desire to keep active, up-to-date and communicated, as well as their need to continue their learning process through tools linked to the network. Here some suggestions focused on the improvement of elderly people's formation and future research on the perception of the Internet as a tool for social participation.

RESUMEN

Es creciente el interés de los investigadores por constatar los beneficios para las personas mayores que conlleva el uso de Internet. La Red ayuda a este colectivo a incrementar la comunicación, evitar el aislamiento y la soledad y, en suma, a promover un envejecimiento activo, objetivo al que Europa dedicó el año 2012. Este trabajo presenta un estudio descriptivo de análisis de serie temporal realizado a lo largo de nueve años (2004 a 2012, ambos incluidos) con el objetivo de conocer la evolución en el nivel, motivos y necesidades del uso del ordenador y de Internet por personas mayores en un entorno de formación universitaria. Se aplica un cuestionario de diseño propio a una muestra de 419 personas con edades comprendidas entre los 55 y 94 años, alumnos del Programa Interuniversitario de la Experiencia en la Universidad de Burgos. Los resultados coinciden con estudios previos que apuntan hacia un notable incremento en el uso de Internet (en número de usuarios, frecuencia y recursos utilizados), motivados los mayores por el deseo de estar activos, actualizados y comunicados; así como por la necesidad percibida de seguir aprendiendo mediante herramientas vinculadas a la Red. Se plantean propuestas de mejora centradas en la formación de los mayores e investigaciones futuras sobre su percepción de Internet como herramienta para la participación social.

KEYWORDS | PALABRAS CLAVE

Education, elderly, education of adults, Internet, ageing, health education, digital divide.
Educación, personas mayores, educación de adultos, Internet, envejecimiento, educación para la salud, brecha digital.

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1. Introduction and state of the question

We live in an information and communication society that has laid the groundwork for the so-called knowledge society (UNESCO, 2011). The technological advances that drive that society are swift, unceasing... Adapting to their speed, on occasions, causes vertigo. On the contrary, not adapting to them means sitting out the game on the touchline, and failing to adapt never favours personal health. We may therefore also talk about technologies and the health of older people, knowing that their needs and concerns as users of technological means of communication (computers, smartphones, tablets..) differ from those of younger people (Wagner, Hassanein & Head, 2010), while acknowledging that education helps to overcome those difficulties (Bélanger & Carter, 2011; Salvador, 2003).

Support for lifelong learning (Field, 2006) is also a common theme nowadays. In Spain, we found programmes for adults over 55 years of age, such as the University of Experience or the University for Older People, in both public and private universities. In particular, the Interuniversity Programme of Experience has been up and running since 2002/2003 in the Autonomous Region of Castilla y León, involving all of its universities. These institutions provide a common educational programme aimed at older people, with the collaboration of the regional social services (Palmero & Jiménez, 2008); learning among older people is promoted to strengthen active ageing. The WHO (2002, 2012) defines the concept of active ageing as an ongoing process of optimizing opportunities for health, participation, and security, in order to enhance quality of life as people age, facilitating active ageing in better conditions. The process is of such relevance that Europe dedicated 2012 to its promotion and its objectives are still alive today.

Education for health is a potent tool with which to encourage active ageing (Davey, 2002), traditionally developed in the classroom and now linked to virtual environments.

Active participation in technological environments can play an essential role in the improvement of health and quality of life for older people (Blazun, Saranto & Rissanen, 2012; Chen, Lee & Kirk, 2013; Sum, Mathews, Hughes & Campbell, 2008): 1) Favouring independence and creativity; 2) Creating new social networks and avoiding isolation and loneliness in society; 3) Allowing access to services related to health, culture, etc. Gracia and Herrero (2008) found that older Internet users maintained better physical health, experienced fewer problems associated with mental illness and showed higher levels of integration and participation than non-users. Meneses, Valente and Rodríguez (2004) confirmed that social activity on the Internet was not incompatible with face-to-face social activity, but that both forms of participation appeared to have similar effects.

The degree of Internet penetration in the population of older people varies notably. In the United States, Fox (2004) pointed out that 22% of Internet users were over 65 years old and around 44% were between 59 and 68 years old. Recently, Zickuhr and Madden (2012) pointed out that half of the people over the age of 65 in the United States, are already online. According to Eurostat (2012), in 2010, about 17% of Europeans aged between 65 and 74 were using the Internet in the Union of the 27 Member States. As of 2007, in Spain, 5.1% of users were aged between 65 and 74, and only 1.5% were older than 75 (INE, 2011; Red.es, 2012). The differences are even larger by gender.

Internet use among older people continues to be low in certain countries, so much so that they have been identified, together with disabled people, as those at greater risk of exclusion in the information society (Dobransky & Hargittai, 2006; Watling, 2011). The so-called digital divide increases, as people age (Fundación Vodafone España, 2011) and it constitutes a significant concern for professionals that work with this population (Abad-Alcalá, 2014). Low levels of computer literacy (Xie, 2011) is due to a multicausal effect. Wang, Rau & Salvendy (2011) found that perceived utility was the most important variable with which to predict the acceptance of technology, followed by ease of use.

In Spain, the Observatorio Fundación Vodafone-CERMI (2011) showed that the main reasons for the low use of technology are poor appreciation of its use in one's daily life; functional limitations; and economic limitations. Nevertheless, despite the barriers that they encounter, older people wish to learn (Aguiar & al. 2003).

Training in computer literacy is therefore needed by users (Norman & Skinner 2006; Xie, 2011). However, it is also noted that web designs are not usually well adapted, as problems of accessibility arise (European Commission, 2010; Czaja & al., 2013; Observatorio Fundación Vodafone-CERMI, 2011). The most significant difficulties found refer to small font sizes, an excess of information on each page, and a lack of clear instructions. Emphasis is therefore placed on the need to have codes of conduct for the improvement of web pages (Miller & Bell, 2012).

As teachers of Education for Health, our interest in education, health and technology led us to propose a practical problem as part of the Interuniversity Programme of Experience at the University of Burgos. On this subject, attention has traditionally been paid to topics such as those identified in the programme put forward by Berensson (2007): nutrition, physical activities, accident prevention. But, in the Spanish context at least, we rarely find a relation between the Information and Communications Technology (ICT), particularly the Internet, older people and active ageing. We therefore found it of interest to first understand the relationship that our older people have with ICTs, as a basis for the work in the Health Education classes and, subsequently, to analyse the evolution of that relation.

2. Materials and methods

The design of the research proposal, in response to the objectives of the study, was correlational and descriptive in nature, with information collected over 9 years, equivalent to 8 academic years (2004/05 to 2011/12). The proposed objectives are:

• To establish the evolution, from 2004 to 2012, of the development of basic ICT indicators (availability and use) in a population segment (people older than 55 years enrolled on programmes of experience at the University) defined by their age and cultural interest.

• To identify the reasons that these older people give for using or not using the Internet.

• To detect the main learning needs/desires of older people regarding the use of the Internet.

We designed an ad-hoc questionnaire, in order to collect information on these variables, without an excessively high number of questions (ten), so as not to overtire the older people. The questionnaires directed at this group have to be as short as possible, as older people easily become tired and a long questionnaire might reduce the quality of the test and the response rate (Wang, Rau & Salvendy, 2011). The test was drafted in plain language, to facilitate the understanding of respondents, as they did not constitute a uniform group and differed in academic levels and age, which are diverse factors that have also been highlighted in various works (Gracia & Herrero, 2008; Imserso, 2011).

The contents of the test are related to the standard indicators on the presence of the ICTs in Spanish society (Gracia & Herrero, 2008). The majority of the items were closed questions (possession and use of a computer, Internet use, and place of access…). The open questions were: what activities do you do with the computer? If you do not use the computer, what are your reasons? Would you like to learn to use a computer and to access the Internet? Why?

Expert judgement was applied at two levels to control the validity of the questionnaire: 1) a review of other questionnaires administered to groups of older people (Aguiar & al., 2003, Gracia & Herrero, 2008; Imserso, 2011); and, 2) a final review by a panel of 8 experts directly linked to educational programmes for older people.

The reliability of the instrument was 0.847 (Cronbach's alpha).

In an initial phase, two researchers conducted the process separately, in order to ensure reliability in the coding of the qualitative questions. Subsequently, the

We find a profile of users motivated by functionality, but also by enjoyment and leisure. The challenge, therefore, will be to maintain their interest in ICTs. It would be relevant to be able to confirm whether the 14% of the population that do not use them and the 26% of the population that do use them on a regular basis now will remain unchanged over the next few years. It would be fundamental, for the first group, to design activities for them to access the Internet that avoid isolation and promote social participation, on the Internet as well. Education will help them to identify the beneficial factors of ICT in their active ageing and to overcome the false belief that technology is only for young people.

results were compared and agreement was reached on the few discrepancies that were found.

2.1. Population and sample

The population under study was constituted by the set of people over 55 years enrolled in the so-called Programme of Experience at the University of Burgos, at its main campuses at Burgos, Miranda de Ebro and Aranda de Duero, over eight academic years (2004/05 to 2011/12). The programme has received public funding from the Junta de Castilla y León. The selected sample consisted of 419 people who answered the questionnaire and who were following the «Education for an Active Life» study programme, as part of the Active Ageing and Quality of Life module.

All together 261 women, 62.29% of the sample, and 158 men or 37.71%, responded to the questionnaire.

Their ages varied between 55 and 94 years old. The average age was 65.42; the mode, 62 years old, and the median, 64. The standard deviation yielded a value of 6.18. By intervals, 58.1% of the sample was between 55-65 years of age; 23.9% between 66-70 years of age; 11.9% between 71-75 years of age; and, 6.1% between 76-94 years of age.

As regards the profession (current or pre-retirement) of the participants, we found a very broad variation in the responses; housewives predominated (22.7%) followed by those with jobs in the industrial sector, at 16.4%.

Classes were followed in both urban and rural environments: 211 of the people surveyed lived in Burgos (50.36% of the total); 133 in Aranda de Duero (31.74%); and 75 participants lived in Miranda de Ebro (17.9%).

3. Analysis and results

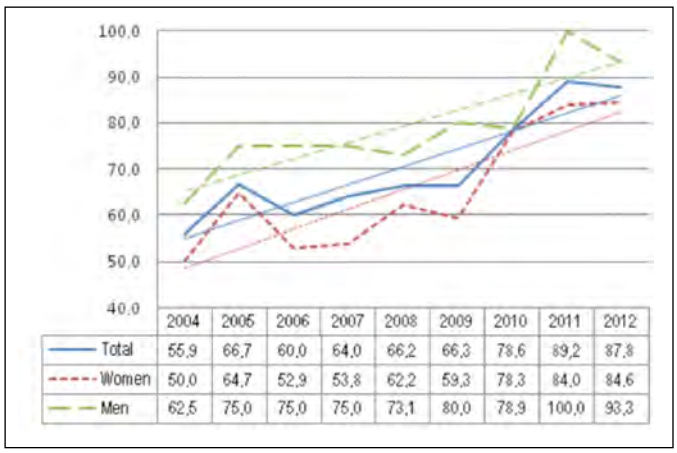
In this section, we explore the results obtained after the application of the descriptive statistical tests that are appropriate for the nature of the variables and the objectives of the study.

• Do you have a computer at home? Although on average, we found that 69.5% of the sample indicated that they had access to a computer at home, observation of the data and its evolution is revealing (figure 1). We noted a clearly positive trend in all cases, presenting an increase, on average, of 31%, which was slightly higher among women (34.6%) than among men (30.8%). Nevertheless, we should point out that the increase remained constant in favour of men (observing a difference of over 10% practically every year), highlighting the disadvantages for women on this point.

Internet access from rural areas maintained these differences by gender, although it was 10% less than in the city.

• Computer ownership. The computer belonged to the survey respondent in 75% of all cases. If we analyse it by gender, 68% of women affirmed that it was their property, as opposed to 84.4% of men. Likewise, it is relevant to study the situation of those people that said the computer was not their own. The alternatives we found were: a) sons/daughters (13%); b) grandson/ granddaughters (0.7 %); c) Others (social organizations…) (0.7 %).

• Use of the computer. With regard to computer use (rated on a 5-point scale from «never» to «very often» in Figure 2), the average scores of the data present a certain balance, given that the values for «never», «a little», and «quite a lot» were very close to 20%, varying substantially from «sometimes» (close to 30%) to «very often» (a little more than 5%). However, when we analysed their temporal evolution, we found a substantial change. Thus, up until 2006, more than 50% of the participants indicated that they used the computer «a little» or «never». From 2008 to 2010, a greater tendency to value its use as mainly «sometimes» was observed. Finally, over the most recent years, 2011 and 2012, it appeared that almost 40% and 50% respectively used it «quite a lot» or «very often». Observing the data over the last 6 years, a rate of around 14% of the sample that «never»



	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total	55,9	66,7	60,0	64,0	66,2	66,3	78,6	89,2	87,8
Women	50,0	64,7	52,9	53,8	62,2	59,3	78,3	84,0	84,6
Men	62,5	75,0	75,0	75,0	73,1	80,0	78,9	100,0	93,3

Figure 1. Evolution of the presence of the computer at home (percentage in each case, over the total by gender).

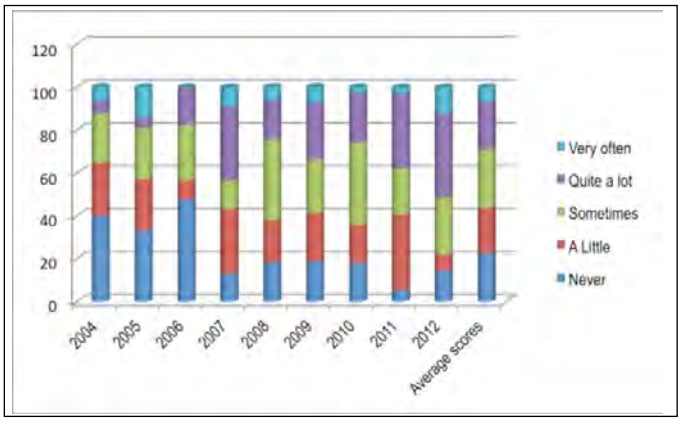


Figure 2. Evolution of computer use.

used the computer appeared to consolidate itself.

Levels of computer use fell as age increased. So, for the total average by age, the population over 76 years of age that used the computer «a little» or «never» was almost twice as high as that of those between 55 and 65 and those under 75 years of age. We found that those who used it «quite a lot» or «very often» tended to remain over 26%.

• Internet Access. A total of 65.1% of all participants accessed the Internet. We found a significant dependence (Chi Squared=64.22; p=0.000) among those who used the Internet and, at the same time, had a computer at home with an Internet connection. Nevertheless, we would point out that this relation was not statistically significant (Chi squared=3.06; p=0.08), in 2004.

The increase in Internet access, on average around 37.9%, was remarkable given that it was almost seven points higher than the increase in the presence of a computer in the household. However, the evolution of the sample varied notably, when we studied it by gender. Thus, in the case of women, it increased by 22%; while in the case of men, the increase was around 52.7%. The women, in the first few years, were those who accessed the Internet to a greater extent, but at present men surpass them by more than 20% (figure 3). In particular, we found that 57.7% of housewives had access to the Internet.

• Place of Access. On average, 48% of participants connect to the Internet from home. This piece of information reflects the progressive incorporation of Internet access in all homes, including in the case of older people. While, in 2004, 26.5% of participants accessed the Internet from their home, at present more than 75% do so (figure 4, see the next page). In other words, the figure has tripled over the 9 years under discussion.

Other spaces were noted, such as at the University, public libraries, Internet cafés and day-centres for older people, although with very small percentages in all cases. The only highlighted case was the University, which was pointed out by 4% of the sample. The home, therefore, is the real reference for Internet use. In the specific case of housewives, the great majority of them accessed the Internet from the home (73.33%), followed by the University (17.77%).

• Internet activities. We found that the relation between access to the Internet and the use of e-mail was significant and positive (n.s.=0.05). When we merged the two variables in a contingency table and tested the hypothesis of independence with the Chi squared test, we obtained a value of 5.903; which, with one degree of freedom, means that the probability of non-rejection of the hypothesis is 0.015. In other words, there is a relation between both variables, although it is not significant at the level of 0.01. It is curious to observe that among the responses of the 6 older people who stated that they did not access the Internet, they nevertheless did consult their email in 4 cases; a statement that might be a symptom of computer literacy levels.

In summary, the majority of those who accessed the Internet did so mainly to use email. As with access to the Internet, the use of email has increased to a much higher rate among men than among women. The percentage of access of both men and women doubled between 2004 and 2012 (figure 5, see the

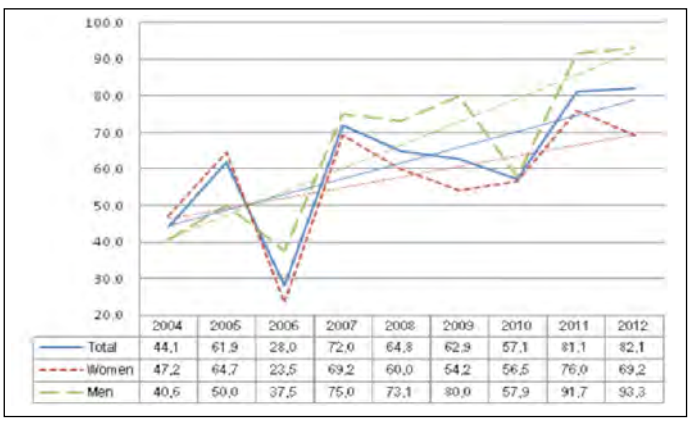


Figure 3. Internet access by gender.

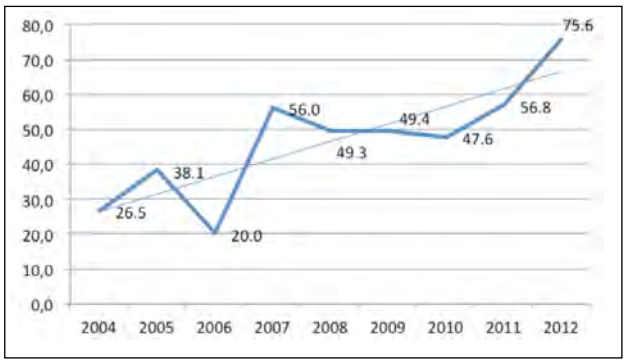


Figure 4. Internet Access from the home.

next page).

After the use of e-mail, the search for information (mainly on: health, cinema, music, and culture), or reading the press on-line, in both cases at 6.7%, represented the most widely practised activities (figure 6). A total of 2.4% reported office work (creative writing, photography), and 1.4% carried out searches related to travel; the same percentage went online to use social networks. This activity has emerged over the last three years: Facebook and Twitter were the most frequently mentioned networks. So, from 2004 to 2008, a small number of users indicated that they used Messenger, a situation that then receded and, we understand, was replaced by more recent synchronic data communication, linked to smartphones, or the aforementioned social networks. A total of 1.2%, men only, indicated that they used this medium for management (e-administration, electronic banking, etc.). Finally, 1% affirmed that they made use of other communication resources (chats and forums) and women related them directly to on-line communication with children.

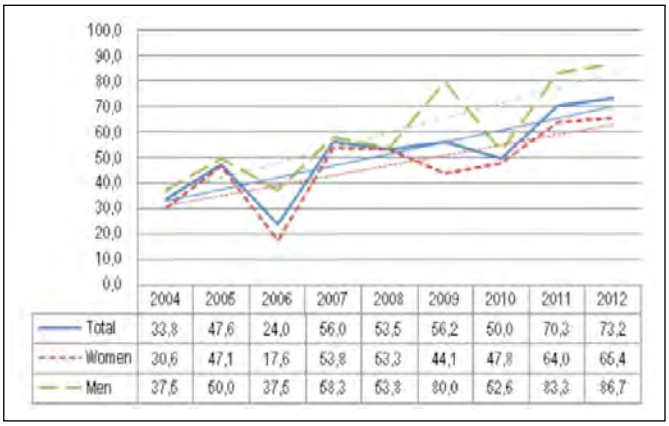
• If you use neither the computer nor the Internet, what reasons might you give? A total of 34% of the sample that answered this question gave the following reasons (figure 7): lack of interest and lack of knowledge stand out at over 25%. A total of 20.4% indicated as a reason that they had no computer or Internet; reasons directly related to economic aspects. A total of 4.2% associated non-use with being an older person. This point is especially interesting, because that response was only given in the first few years of the study (2004-08). It is surprising that some affirmations are not consistent with the later responses to the same questions. So, for example, 50% of those who expressed lack of interest expressed different arguments later on, to explain why they would like to learn to use the computer and the Internet.

• Would you like to learn to use a computer and to access the Internet? Why? A total of 82.7% of the sample (between 2004 and 2009) of those that made no use of the computer/Internet affirmed that they would like to learn how to use it and only 17.3% said that they would not like to learn how to use it. Figure 8 was constructed, after a coding process, on the basis of the responses to this open question.

The reasons given for wishing to learn are varied and an interest in the Internet may be highlighted, because, among other reasons, it opens new learning possibilities. Further reasons that they gave were: usefulness, the possibility of looking for information, entertainment, curiosity, current affairs and quality of life, as shown in Figure 8, which includes the single percentage response and that shared with other reasons.

4. Discussion and conclusions

Our study has presented a descriptive analysis over nine years, which corroborates that older people with a degree of motivation to remain active in the learning process, evidence of which is their enrolment on Programmes of Experience in the province of Burgos, were increasingly using the computer and accessing the Internet, as has also been reported in other national and international studies (Imserso, 2011; Zickuhr & Madden, 2012). The main point of access is the home, but there are also other points (University, and social centres for instance) (Aguiar & al., 2003). This access from outside the home occurs to a greater extent in the rest of the population in the



	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total	33,8	47,6	24,0	56,0	53,5	56,2	50,0	70,3	73,2
Women	30,6	47,1	17,6	53,8	53,3	44,1	47,8	64,0	65,4
Men	37,5	50,0	37,5	58,3	53,8	80,0	62,6	83,3	86,7

Figure 5. Evolution of the use of e-mail by gender.

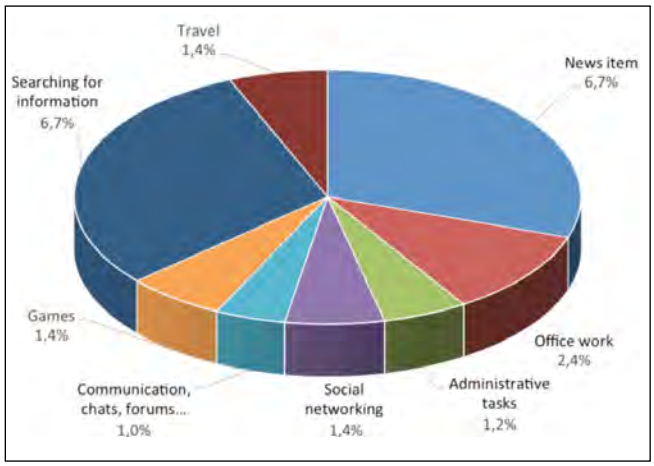


Figure 6. Activities carried out with the computer (percentages over the total since 2004 to 2009).

context of university programmes for older people (Imserso, 2011).

We also found an increase in the presence of computers at home. In 2007, 64% of our sample affirmed that they had one, close to the average in the EU27 (67%) (Red.es, 2012).

Our results differ from the reality of the general population of older people, as according to data from Imserso (2011:489), «only 16.7%» of them «have a computer», set against the figure of 78.6% from our sample in 2010; which shows almost five times more. This may be due to the characteristics of the population that participated in the survey.

Gender influences the presence of a computer in the home: women are clearly in a disadvantaged situation, both as regards the use and ownership of a computer (Imserso, 2011). In some cases, they appear in a somewhat submissive role, sharing that computer when they have one, or assuming that it belongs to the husband; attitudes which the men did not express.

The results match those of previous studies that pointed to a noticeable increase in the use of the Internet (in number of users, frequency, and resources). The Vodafone Foundation, Spain (2010), underlined that housewives and older people of over 80 years of age are the groups most distanced from ICTs. Housewives predominate in the sample of our study, but we have not found that they are distanced from the Internet. On the contrary, they show high levels of participation and evolution.

It should however be noted that the study concerns women who have demonstrated an interest in training in general, when attending a university programme.

We have a sample with almost twice as many women as men, but the figures are very different when we see the increase in the use of Internet: it is more than double in the case of men (52.7%) than in the case of women (22%). We may therefore say that «the use of ICT is more extensive among older men than among older women» (Imserso, 2011: 312)

We agree with different studies (Eurostat, 2012; Selwyn, Gorard, Furlong & Madden, 2003), in that the most frequent activity/service is, by far, e-mail consultation. In exactly the same way, we see that the contents by preference refer to culture, leisure and the media. A novelty that our study offers is the emergence of social networks (Facebook, Twitter) and their use in recent years, consistent with present day developments. This line of research starts to arouse interest when wishing to identify the perception of older people with regard to social networks and the educational strategies to teach older people how they may be used (Xie, Watkins, Golbeck & Huang, 2012).

We also found that among those who used the Internet and those who would like to begin to do so, the motivation for the participation in entertainment activities (on-line gaming) is on the increase. If functionality has been key to get closer to the Internet (Wang, Rau & Salendy, 2011), we find a new generation that associates the Internet with enjoyment in their free time, in contrast with other traditional models of leisure in this population.

The majority of our older people, who have no computer at home or do not use one, would like to

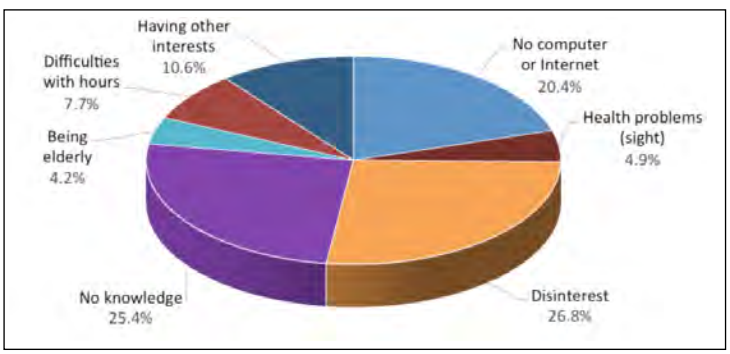


Figure 7. Reasons why the computer is not used (percentages over the total from 2004 to 2009).

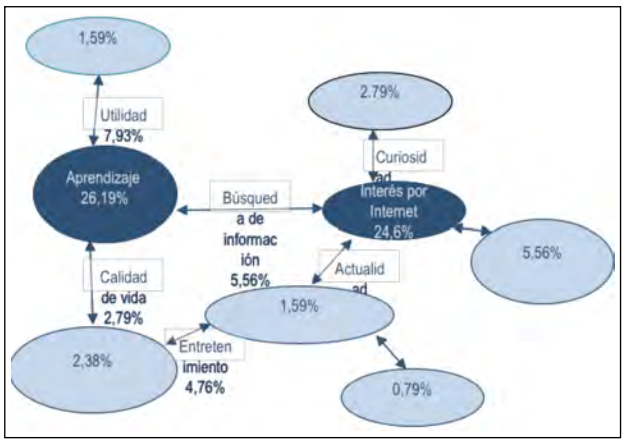


Figure 8. Arguments why respondents would like to learn to use the Internet (various reasons could be given).

learn how to use one and to access the Internet, as Gracia and Herrero (2008), and Aguiar and others (2003) also found. The technologies are of interest to them and they believe that they can be updated and that they can learn with them.

The reasons that they give for not using Internet coincide to a great extent with those presented by the Observatorio Fundación Vodafone-CERMI (2011): lack of interest, they do not expect it will contribute anything to their daily routines; they did not have to use computers in their working lives; they were scared of making a mistake and losing all the information; functional limits, etc.; and these reasons relate to the variables for the acceptance of the technology studied by Wang, Rau & Salvendy (2011).

Overall, we believe that we have achieved the proposed objectives, although we find limitations linked to the instrument and the context of its application. The questionnaire did not contemplate different variables (level of education, specific items related to the Internet and to health, etc.), which would have allowed us to broaden the study and look in greater depth at the results, contrasting them with similar studies, given that health is a topic of great interest for older people (Campbell, 2004; Karavidas, Lim & Katsikas, 2005).

With regard to the context, we consider that carrying out the survey in an almost formal education environment (a university classroom) might create insecurity when responding to questions, creating an uneasy feeling if, for instance, they had to declare their level of Internet literacy in front of others. This could lead to responses that reflect «social desirability» rather than reality, a problem of a methodological nature that subsequent studies may consider.

We consider it necessary to stimulate measures that encourage the use of the Internet centred on education, accessibility, and a cross-cutting consideration of the female condition. Any measure, whether educational, technical, or of any other sort, has to consider women and their access to technological resources, in such a way as to advance towards equality, reducing the digital gender divide, as has indeed been happening (Instituto Nacional de Estadística, 2011), and the consideration of gender in active ageing (Foster & Walker, 2013). In our study, we found that the promotion of social relations, among both family (children) and friends, is a priority in the case of women, which may be used as a stimulus so that they gain greater familiarity with the Internet.

It appears that participation in training programmes for older people has been proven to increase the use of ICTs and their gradual inclusion in the household (Imseso, 2011; Xie, 2011). Training in various contexts is proposed in the Programmes of Experience (Pavón, 2000), including a course called «Introduction to the use of the computer and the Internet», directed at all students; moreover, increasing the use of ICTs in all subjects, implying greater involvement among older people (Internet platforms, emails, chats, forums, etc.). The results of training in this field are very positive if their needs are taken into account (Czaja & al., 2013; Villar, 2003). Moreover, we consider that peer tutoring can be an interesting didactic strategy that helps with training, as we found that some older people are already using more recent technological resources.

In the light of our findings and with regard to the population segment of older people that participated in the Programme of Experience at the University of Burgos, which might well share similarities with the same segment that participates in these programmes throughout the rest of Spain, we may conclude that:

- The presence of computers in the household and the level of Internet use increases with the number of years in the study.
- Older people use the computer and the Internet less as they advance in age.
- Women are at a disadvantage regarding aspects such as ownership and use of a computer and Internet access.
- Differences emerge between rural and urban areas in favour of the latter.
- The most frequent Internet activity is the consultation (receiving/sending) of email; the most searches were conducted in relation to culture, leisure and the media.

• Over recent years, the use of certain social networks has begun with this age group.

• The majority of older people wish to learn how to use computers and how to navigate on the Internet, as they consider that these are useful skills to acquire knowledge, stay up-to-date, and to participate in leisure activities.

In line with our results and conclusions, a study by the Fundación Vodafone, Spain (2010) warned that over the coming years we would see a natural increase in the use of ICTs among older people in Spain. As their use increases among the general population, the number of retired people who have previously used them at work will also increase. Within that population, we find a profile of users motivated by functionality, but also by enjoyment and leisure. The challenge, therefore, will be to maintain their interest in ICTs. It would be relevant to be able to confirm whether the 14% of the population that do not use them and the 26% of the population that do use them on a regular basis now will remain unchanged over the next few years. It would be fundamental, for the first group, to design activities for them to access the Internet that avoid isolation and promote social participation, on the Internet as well. Education will help them to identify the beneficial factors of ICT in their active ageing and to overcome the false belief that technology is only for young people.

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New Elders, Old Divides: ICTs, Inequalities and Well-Being amongst Young Elderly Italians

Nuevos mayores, viejas brechas: TIC, desigualdad y bienestar en la tercera edad en Italia

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ABSTRACT

When compared to more digitized western countries, Italy seems to have suffered a delay of ten years, in both the use of ICTs by the elderly and the study of the relation between elderly people, ICTs and ageing. Considering this time lapse, it is now urgent that we question the factors that influence the adoption of ICTs by the elderly and whether ICTs can provide cultural and relational resources that could improve the quality of life of elderly in terms of health and social life. This article describes the main findings of a survey carried out as part of a larger national research project focused on active ageing, which involved 900 Italian people aged between 65 and 74 years of age. The research investigates socio-demographic characteristics of young elderly Italian Internet users and factors related to their use of ICTs. Results have shown that there is a strong digital divide between young elderly Italians, which is primarly influenced –in terms of classical dynamics– by differences in economic, social and cultural capital. With regard to the theme of active ageing, if it is true that highly digitalized young elders are generally characterized by good health, at the present stage of this research it is not possible to indicate whether the adoption of ICTs guarantees social inclusion and participation.

RESUMEN

Italia parece tener un retraso de unos diez años en comparación con otros países más digitalizados, tanto en el uso de las TIC por las personas mayores como en el estudio de la relación entre las TIC y los mayores de 65 años. Por ello, se hace urgente examinar los factores que influyen en la adopción de las tecnologías por los mayores y la capacidad real de estas para proporcionar recursos culturales e interactivos, útiles para mejorar el envejecimiento activo y mejorar su calidad de vida en salud y vida social. Este trabajo describe los principales resultados de un estudio que involucró a 900 italianos de 65 a 74 años, en el marco de un proyecto nacional de investigación sobre el envejecimiento activo. El estudio indaga en las características sociodemográficas de los mayores italianos usuarios de Internet y en los factores que influyen en el uso de las TIC. Los resultados evidencian que existe una fuerte brecha digital entre los mayores, influenciada por el contexto económico y cultural. En cuanto al envejecimiento activo, se demuestra que los mayores altamente digitales presentan una mejor vida saludable en su envejecimiento, sin poderse concluir que el uso de las TIC garantice la inclusión y participación.

KEYWORDS | PALABRAS CLAVE

Digital literacy, digital divide, health, leisure, use of Internet, Internet, social network, active ageing.
Alfabetización digital, brecha digital, salud, tiempo libre, uso de Internet, Internet, redes sociales, envejecimiento activo.

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1. Introduction

In many studies focused on the adoption and use of ICTs by the elderly, one of the most widely used theoretical frameworks has been that of the digital divide, both on the primary level, in which the divide lies between the «haves» and «have nots», and on a secondary level, which is related to digital literacies, competencies, skills and motivations (Loges & Jung, 2001; Hargittai, 2002; Warschauer, 2002). Within this framework, as it is known, age seems to be one of the most discriminatory socio-demographic variables, to the benefit of young people.

In recent years, the increasing focus of international and European policies on the theme of active ageing1 has provided a second framework, according to which it is now possible to contextualize the adoption of ICTs within a far broader scenario – that of the progressive ageing of European populations (European Commission, 2011). Following the latest sociological research debate (Riva, Ajmone Marsan & Grassi, 2014), active aging is not understood solely in terms of structural (good/bad health) and economic (lengthening of working and leisure age) well-being, but also in terms of «quality» of life and as a subjective and socially rewarding ageing. Hence, the specific objective becomes to determine what «active aging» really means –from the point of view of the subjective, intersubjective and collective opportunities–, in relation to practices, ideas, values and cultural perspective. Today the role of media and communication technologies in improving the quality of life (Sourbati 2008), health (European Commission, 2011) and care (Olve & Vimarlund, 2006) of the elderly is a key issue in the academic discussion on ageing. In particular, there is discussion on the role of ICTs in the life of the elderly: if it is true that ICTs are a useful resource for the elderly to improve their health, care and social life (Selwyn, 2004), it is equally true that recent researches are uncovering risks and showing the dual role of the ICTs in daily life of the elderly (Aroldi & al, 2014).

The adoption of ICTs by the elderly is a well established area of research in countries like the US (Saunders, 2004), the UK (Haddon, 2000) and Scandinavian countries (Naumanen et al., 2009), where the penetration of the Internet into the home environment occurred early and rapidly, involving a significant portion of the older population. In comparison to other, more digitalised countries, Italy seems to have suffered a delay of around ten years (ISTAT, 2013), which makes it all the more urgent that we start to question the factors that influence (or hinder) the adoption and domestication of ICTs (Silverstone & Hirsch, 1992) by the elderly population and the real ability of digital technologies and networks to provide cultural and relational resources that improve the quality of life of older people.

Based on this theoretical background, the research questions that guided our research project were as follows:

1) (a) What are the socio- demographic characteristics of elderly Italian Internet users?; (b) What factors are related to the use of ICTs by these older users?

2) (a) How are ICTs used and incorporated (Silverstone & Hirsch, 1992) into the everyday life of the elderly?; (b) How do they contribute to an improved quality of life and active ageing?

To this end, this article describes the main findings of a survey carried out as part of a larger national research project focused on active ageing in Italy (Riva, Ajmone Marsan & Grassi, 2014).

2. Material and methods

The research project is based on a survey conducted between December 2013 and January 2014 through a face-to-face questionnaire administered to a statistically representative national sample of 900 young elderly Italians aged between 65 and 74 years of age (selected according to a random, proportional, stratified division defined by region and by the size of the place of residence, divided into two sampling stages)[1].

The questionnaire collected data related to information concerning family relations; health status; leisure time and cultural consumption; any past or present working condition; participation in any kind of volunteering or socio-political activities; social capital and social solidarity; family networks and friendships; values; representation of the elderly condition, and the economic status of respondents.

With regard to media use, the questionnaire aimed to investigate:

- Choice of technological devices (personal and domestic digital devices).
- The preferred times and amount of time spent using PCs and the Internet
- Ways of using PCs and the Internet (chosen places, platforms used and people involved).
- Types of activities carried out using PCs and the Internet.
- Ways of learning how to use PCs, online services and the Internet (places and people involved in the learning activity).
- Reasons for using the Internet (changes in the

lives of the elderly caused by the use of the Internet; fears, anxieties, enthusiasm in the use of PCs and the Internet).

3. Results

3.1. Possession and use of ICTs technologies: the socio-demographic characteristics of digitalized elders

In this section we will introduce the key findings of the questionnaire concerning the possession and use of digital media by younger elderly Italians, correlated with socio-demographic characteristics.

Firstly, it is significant to note that possession and use of digital media involve only a part of the sample, since only 21.3% of elderly Italians possess or use a computer (17.5% own and use a laptop, 16.7% own and use a desktop PC).

These data become more interesting if related to specific age groups (distinguishing between two age groups: 65-69 and 70-74) and gender. Men aged between 65-69 own and use computers and the Internet significantly more the than elderly women: women over 65 who have never used the Internet comprise 81% of the sample, compared to 65.6% of men.

Interestingly, the difference between men and women is less relevant than it is in relation to other technologies: although it is true that all devices (PCs, laptops, smartphones, MP3, game consoles) are available and used more by males than by females (with a forked variable between the two genres), two devices (namely iPad and eBook reader) are an exception. Percentages of elderly males and females using tablets (including iPads) and eBook readers are very similar: respectively 6% of men versus 3.8% of women use tablets and 1.9% of men versus 1.5% of women use eBook readers. Given that tablets, iPads and eBook readers are new technologies and that «new users» tend to be women more often than men, this shows a likely phenomenon of leapfrogging. A significant number of elderly users who start to use ICTs when they are older than 65 (especially women) do so by using a new generation of technologies but skipping previous technologies (PC-laptops). 20% of elderly female users claim to access the Internet using mobile devices, compared to 8.5% of men, who are more often traditionally rooted, prefering to use to desktop devices.

Analysing the characteristics of digitalized elders in more detail, 45% of the elders who use computers today started using them before they turned 50, 28.2% started between 50 and 59 y.o.a. and 19.1% between the age of 60 and 64. Only 9.1% of users are «new» ICTs users (who started using a computer after the age of 64), with a significant difference between males (6.8%) and females (12.8%).

In terms of the preferred locations of Internet access, home is regarded as the best place, with 98.8% of users citing domestic connections and, in second place, 15.3% of connections at work (among our sample with Internet access). The elderly usualy access the Internet by themselves, with a significant proportion of seniors accessing the net with the help of their partner (19.2%), their children (17.6%), or their grandchildren (4.7%). As far as learning processes are concerned, 49.8% of users stated that they had learnt to use a computer at work, with a significant difference showing between males (57.8 %) and females (37.6

> As our results suggest, active ageing cannot be simplistically defined by the possession of technological devices or their use: active ageing signifies «quality of life» that could also be related (but not determined by) the many uses of ICTs. These results suggest the necessary development of inclusive digital policies and education programs that take into account the risks and benefits, as well as the complex role played by ICTs. The processes of digital inclusion should aim to promote the «good use» (conscious, careful, thoughtful, moderate, unperturbing relational contexts) of ICTs and not simply the diffusion of computers, tablets and smartphones to deal (deterministically) with age related problems.

Table 1: Correlation table with the most significant indices related to socio-demographic characteristics and the use of ICTs - Chi Squared distribution

	TECHNOLOGICAL EQUIPMENT[2]	PC & INTERNET USE[3]	USE OF SNSS[4]
Working condition[5]	.195*	.18*	(.109) (SL=,009)
Status[6]	.467*	.467*	.338*

Base: Elderly Italians aged between 65 and 74 years of age. All indices are recoded in three categories (N=900; *Significance level SLI=.000).

%): if most males learned at work, the proportion of women who learned how to use a computer by attending courses offered by organizations or associations, or municipal institutes, is substantially higher (22.8%) than that of men (14.3%). Males seem to have a more solitary learning approach, which is either practical (45.5% vs. 40.6 % of women) or guided by self-learning manuals (14.9% vs. 6.9%). Conversely, in addition to courses, women make more use of the help of younger friends or relatives (36.6% vs. 31.2 % of males) or peers (9.9% vs. 2.6%).

As far as SNSs use is concerned, a significant number of elderly Internet users joined Facebook and Twitter. In particular, 27.9% of male and 28.9% of female Internet users are on Facebook, while 11.5 % of male and 6.7% of female Internet users are on Twitter. It is noteworthy that, the users who access these tools use them very often: 46% of elderly male and 73% of elderly women with a Facebook profile use it every day.

Hence, there is a significant gender difference, with women being particularly heavy users of Facebook. Furthermore, SNSs use is strongly influenced by the differences between the two identified age groups: while 31,8% of the 65-69 year old sample use Facebook, the percentage drops to 21.1% in those aged between 70-74 years of age.

Moving away from the topic of allocations to the use of ICTs, an interesting point emerges in relation to the frequency of use. 71% of the elderly who access the Internet do so almost every day. As further evidence suggests, 58.8% of the elderly state that they access the Internet at any time of the day, but probably only when it is needed for something useful.

Having introduced and described the main characteristics of the digitalized elders (our first research question), let us now introduce the factors that are either positively or negatively correlated to the use of ICTs by Italians between 65 and 74 (question 1b),

To answer this research question, we proceeded to build some indices that would outline the socio-economic status of the elderly. These indices were then crossed with the synthetic indices that describe the technology used – i.e. the use of the PC and the Internet, and participation in SNS - in an attempt to link the most significant correlations between allocation and use of information technology and the personal condition of the elderly users. The following table records the most significant correlations, between the indices used.

Status appears to be significantly correlated to technological equipment, the use of PCs and the Internet, and the use of SNS. Working condition appears to be rather weakly correlated to both the adoption of digital technologies and their use. There is no significant correlation between working condition and social networks, nor between marital status and indices related to new technologies.

Furthermore, it is also interesting to note that, unlike the relation to technological equipment, differing employment status affects the use of social networks relatively little, in fact, amongst our elderly interviewees, Facebook appears to be a niche service that is transversal and less affected by the differences between workers and non-workers.

3.2. Possession and use of ICTs, well-being, active ageing

In this section we consider a number of indices that describe the quality of living conditions and the activity of older people from different points of view in relation to the use of ICTs. These indices relate to cultural and media consumption, health status, perceived seniority, physical activity, social capital, the intensity of relationships, intergenerational solidarity and individual and overall satisfaction in relation to the quality of their lives. These indices were then crossed with the indices that describe the technological equipment the use of a PC and Internet, and participation in SNS, in order to capture the most significant correlations between allocation and use of information technology, and overall quality of experience and activity of the elderly.

Beyond the allocation and use of PCs and the Internet, it is interesting to investigate how the possession and consumption of digital media fits into the concept of media diets and the broader cultural consumption of the elderly. Within the broader scope of analysing the leisure activities of the elderly, it is interesting to investigate whether the media diet of our sample

presents any dynamic examples that feature the replacement / integration of old and new communication media.

This correlation table shows some interesting results: the use of technology, of PCs, the Internet and SNS were all significantly correlated with indices of cultural and media consumption. A culturally active life is linked to intensive use of digital media, just as the use and consumption of digital media does not replace old media, but rather links this usage to a high use of media (both in terms of time and variety of means). In particular, the index of cultural consumption is strongly correlated with the index of technological equipment, confirming the relationship between (economic and cultural) well-being of elderly individuals and access to the digital world.

Table 2: Correlation table with the most significant indices related to cultural consumption / use of media and the use of ICTs – Chi Squared distribution

	TECHNOLOGICAL EQUIPMENT	PC & INTERNET USE	USE OF SNS
Cultural consumption [8]	.421*	.444*	.307*
Media fruition [9]	.276*	.296*	.209*

Base: Elderly Italians aged between 65 and 74 years of age. All indices are recoded in three categories (N=900; *Significance level - SL=.000).

Shifting from economic well-being and status towards a broader reflection on the concept of psycho-physical relationships, the following table accounts for Spearman's correlation coefficient (rs) of the most significant correlations (direct or inverse) between the indices used to define the quality of life and those relating to the use of ICTs.

It is noteworthy that the most significant direct correlations, with regard to technological equipment, the use of PCs and the Internet and the use of SNS, appear to be those relating to the index of physical activity and number of friends, while the most significant inverse correlation concerns the users' perceived age. It is also possible to detect a correlation between technological equipment and the use of PCs and the Internet when compared to the indices of individual satisfaction, social capital and propensity towards intergenerational relations. However, the values indicate an inverse correlation with respect to intergenerational family solidarity. In addition, compared to these indexes, the use of SNS seems to be correlated to a lesser extent and not particularly meaningful. Finally, there are no significant correlations between the use of SNS and the indices of personal satisfaction, social capital, or intergenerational relations.

Overall, the data indicate that the possession and use of ICTs is more likely to accompany an elderly condition characterized by good levels of physical activity, a large number of friends and a low perceived age. General social capital is also a significant element of this condition, as is the propensity for intergenerational relationships, while family solidarity is not.

A second means of assessing the importance of ICTs in the context of the activity of young elders is based on the cluster analysis; the five clusters were identified and their weight in the sample calculated as follows (Rossi, Bramanti & Moscatelli, 2014):

The first cluster, equal to about one-fifth of the sample, consists mainly of women aged between 70 and 74 with low socio-economic status, few health problems and limited social relations, who are at risk of exclusion. The second and largest cluster (almost one-third of the sample), includes mostly retired couples, with an average income, relatively low in status, who are in good health and have a good network of friends and family, but cultivate few interests or forms of social engagement, with the exception of an average level of physical activity. The third cluster of older people is the smallest (slightly more than one in ten), who live in extended family households, or in the presence of adult children at home because they are strongly committed to their children and grandchildren. This cluster is found more in the south of Italy and is characterized by a low income status, even when compared with the low general average,

Table 3: Correlation matrix comparing the most important indices relative to the quality of life and the use of ICTs – Spearman Correlation

	TECHNOLOGICAL EQUIPMENT	PC & INTERNET USE	USE OF SNS
Physical activity[10]	.319*	.332*	.246*
Number of friends	.229*	.234*	.155*
Perceived age[11]	- .136*	- .146*	- .120*
Personal satisfaction[12]	.133*	.125*	(.046, SL=.170)
General social capital[13]	.105*	.114*	(.059, SL=.076)
Propensity towards intergenerational relations[14]	.127*	.120*	(.091, SL=.006)
Intergenerational family solidarity[15]	- .110*	- .103*	(- .073, SL=.029)

Base: Elderly Italians aged between 65 and 74 years of age. All indices are recoded in three categories (N=900; *Significance level-SL=.000).

Table 4: The five activity clusters		
CLUSTER N°	DESCRIPTION	% OF SAMPLE
1°	Women ... precociously aged	20.6
2°	Couples who enjoy their pension!	31.4
3°	Supportive extended families	11.2
4°	The sociable elders	21.3
5°	The busy elders	15.5
Base: Elderly Italians aged between 65 and 74 years of age.		

and represents an approach to active ageing that almost seems to continue on without distinction from the middle stage of life. The fourth cluster, the «Sociable» elders, constitutes more than one-fifth of the sample and is characterized by a dense network of friendships, parental and neighborhood relations and a high personal and relational satisfaction index. These individuals do not yet perceive their age as a limit and confirm a high level of physical activity. Finally, the «busy» elders confirm a 360° activity level. These individuals are mostly men between 65 and 69 years of age, who are still engaged in high status and high income employment, and invest in the support of younger generations, participate in club activities, do exercise and nurture high levels of confidence in others and of social solidarity.

The survey index of PC and Internet use in the five clusters is as follows (table 5).

As is shown, ICTs are irrelevant for both older women who are exposed to the risk of exclusion (1st cluster), and for spouses who are fully involved in family support within the context of a low-mid socio-economic background (3rd cluster); their presence is nil or limited with relation to both pensioner couples dependent on the private sector (2nd cluster) and the most Sociable individuals (4th cluster). The presence of ICTs use is notably higher and more significant to the «Busy» elders (5th cluster), especially for those who enjoy higher levels of activity, are often still involved in the working world and have a strong «generative dimension which includes the family and social area [...] and identifies a profile of individuals who enjoys good overall satisfaction» (Rossi, Bramanti & Moscatelli, 2014).

Finally, some indication of the perception of the role of ICTs in defining the quality of life of older respondents is derived from a battery of questions, which describes the changes felt while using Internet. 63.7% of older users noted positive changes with regard to the cognitive dimension (information on current affairs and personal interests), while 36.3% refer to positive changes in the sphere of relationships («I stay in touch with my friends and family») and the overall perception of their own activity («compared to my peers who live without the Internet I feel more active»). For many respondents the Internet is a knowledge resource used in relation to health and well-being (40.3%) and in gathering information relative to the treatment of their diseases (29.9%). Other areas of perceived change affect the concept of time management: about 25% say they watch less television, but only 13.5% said they spend too much time on the computer and about 8% stated they had become more sedentary and / or pass more time at home; the incidence of those who think they spend less time with their loved ones (2.2%) is even lower.

Another aspect, which is not negligible, even though it affects a distinct minority group, is the problem area of fears related to the use of Internet: some elders fear making mistakes, or that their privacy will be violated (over 20%), or fear that they are not able to assess the reliability of online sources (18.7%). Finally, although the use of the Internet is generally accompanied by a perception of increased activity and social interaction, participation in online and offline activities still remains a minority practice (from the 12.5% of those who feel «more active in the life of my local community / community / neighborhood», to the 4.1% who express their opinions more freely in SNS).

4. Discussion and conclusion

The results of the survey presented here show how:

• Question 1a) the digitalized elderly feature as a (significant) minority in the Italian population aged between 65 and 74, and share highly specific, distinctive demographic and relational characteristics in relation

Table 5: Index of PC and Internet use in the five activity clusters						
CLUSTER N°	DESCRIPTION	USAGE INDEX FOR PC'S AND THE INTERNET	% IN THE SAMPLE	% IN THE CLUSTER	T VALUE	PROB
1°	Women ... precociously aged	Nil	73,13	93,70	7,91	0.000
2°	Couple who enjoy their pension!	Nil	73,13	80,67	3,39	0.000
3°	Supportive extended families	Nil	73,13	92,25	4,89	0.000
4°	The sociable elders	Limited	7,78	10,53	1,39	0.082
5°	The busy elders	High	19,09	73,97	15,82	0.000

to their non-digitalized counterparts, with a stable economic and employment condition coming first, followed by a higher level of education, as well as a satisfying relational context and good levels of physical activity.

• (Question 1b) the domestic context seems to be crucial to the adoption of new technologies and influences their «good use»: the home is the place in which most elders' media consumption develops, including uses related to new media (V27 Where access PCs, V32.1 Access to the Internet: at home). Media consumption by the elderly is developed within both temporal and spatial contexts, and produces processes of media domestication and routine that are shared / negotiated within the family. Beyond the biological fact of age, there are other stories (personal, work, family, generational) that influence the domestication of technology. Completed professional experiences, relationships with family, and even the spatial organization of the home, are all factors that strongly influence access to and the use of ICTs.

• Question 2a the Internet is extensively and continuatively used by our digitalized elders. The majority of the (few) younger elders who access the Internet are in fact heavy users. Accessing the Internet is a common practice rooted and incorporated into the everyday life of our sample: once they have crossed the threshold of Internet access, users become mature users in all respects and are no longer occasional visitors.

• Question 2b) the possession and use of ICTs is more likely to accompany an elderly condition characterized by good levels of physical activity but some answers to our questionnaire (V38: «Since using the Internet... ») have pointed out that prolonged and excessive use of the Internet, alongside w a number of positive changes, is sometimes identified by elders as a problem in relation to their family life, their previous routines, and the potential activities now no longer carried out in favor of the Internet.

Amongst the potential signs that reveal the ambivalent role of ICT, is that, in some cases, ICTs are used in an attempt to resolve difficulties. In an apparently paradoxical comparison, although the correlations are not significant, the use of SNS is inversely correlated to the relational satisfaction index (rs = -.067; SL=0.45) and is only weakly related to social capital indices, when compared to the use of PCs and the Internet. This would almost seem to indicate a compensatory use of SNS due to a network of weak or unsatisfactory social relations rather than an online investment countered by a strong social capital offline.

These results help to contextualize the phenomenon of the progressive digitalization of older Italians in terms of the «classic» dynamics of the digital divide, which are influenced by socio-economic dimensions (Loges & Jung, 2001; Smith, 2014). Thus, wealthier elders, with a greater cultural and social capital, and who started to use computers during their professional working career, are characterized by increased susceptibility to possession and use of ICTs. This is a phenomenon –that of the digital divide related to income– that significantly characterizes the early stages in the spread of ICTs significantly. In poorly digitalized segments such as that of the elderly Italian population, ICTs courses seem to have spread by «traditional» means, resulting in processes of exclusion based on income, and social and cultural capital (Van-Dijk, 2005).

Hence, we are faced with an increasing polarization and radicalization of the haves and have nots, in which a sizable chunk of young elders is disconnected and risks marginalisation (due to broader social factors), while for a minority of more affluent users (economic and social), digital media has penetrated everyday life with extreme force, in terms of both the time spent on and economic and relational investment therein.

In truth, things could change in the coming years: the arrival of a new generation of elders who grew up in a more digitalized, computerized society (including their professional sphere) than their predecessors, may dilute the centrality of income and status levels in determining the phenomenon of the digital divide. From this point of view, the generational approach on one hand (Aroldi & Colombo, 2013; Loos, 2011) and the repetition of this survey after a number of years could clarify the direction this phenomenon will take.

With regard to the relation between ICTs and well-being, at the present stage of this research it is not possible to indicate whether the adoption of ICTs guarantees inclusion and participation. The transverse diffusion of technology amongst older people probably does not automatically determine greater well-being for all: the issue of ICTs adoption and active ageing requires further investigation, before we can understand the role played by ICTs in the daily life of the elderly and their relational, spatial and temporal organization in domestic contexts (Haddon, 2000) fully. Using the domestication theory framework and an ethnographic approach, we are undertaking a second phase of our research with a qualitative approach in order to investigate the subjective dimension of the perceived role of ICTs and personal story of «conver-

sion» (Silverstone & Hirsch, 1992) of ICTs into tangible meanings and values that contribute to the quality of the elderly everyday life.

Finally, some considerations in terms of policies and education. As our results suggest, active ageing cannot be simplistically defined by the possession of technological devices or their use (Dickinson & Gregor 2006): active ageing signifies «quality of life» that could also be related (but not determined by) the many uses of ICTs. These results suggest the necessary development of inclusive digital policies and education programs that take into account the risks and benefits, as well as the complex role played by ICTs. The processes of digital inclusion should aim to promote the «good use» (conscious, careful, thoughtful, moderate, unperturbing relational contexts) of ICTs and not simply the diffusion of computers, tablets and smartphones to deal (deterministically) with age related problems.

Notes

[1] 1,600 names were extracted from electoral list of 90 municipalities, using the systematic method. 900 were the repondentes. Error sample: 3%; confidence error: 0.05%.

[2] This index consists of the elaboration of answers related to questions on the possession and use of ICTs (Laptop or Netbook, Desktop computer, tablet, e-book reader, Smartphone, WiFi, MP3 player).

[3] Questions related to the frequency of PC use and the nature of the activities effected (copying-moving files or folders, using 'copy-paste', calculating formulas in spreadsheets, transfering files from a PC to other devices, using e-mail, playing online games, reading the news, refering to Wikipedia, blogs, forums, community-produce UGC, searching for information related to on daily life and health, performing administrative, shopping online)

[4] Responses regarding the use of Facebook, Twitter, LinkedIn, YouTube and related services (chat, shares, comments).

[5] Works/does not work.

[6] Responses regarding the professional activity and level of education of the respondent, their partner and father.

[7] Single, Married, Widowed, In a Domestic Partnership, Separated / Divorced.

[8] Responses regarding the frequency of reading books and of going to concerts, shows, museum, lessons.

[9] Responses regarding the frequency of viewing, listening and reading of television, radio, newspapers, and weekly publications.

[10] Responses regarding sporting activities, outdoor activities, dancing, travelling etc.

[11] Responses regarding the subjects' reflexive perception of their age.

[12] Responses regarding individual satisfaction in relation to income, health, work, place of living and spiritual elements.

[13] Responses regarding the interest shown in and trust in others (fellow countrymen, foreigners, Europeans, disabled, children, the unemployed, the elderly).

[14] Responses regarding the opinion on the desirability and dynamics of collaboration between older and younger users.

[15] Responses relating to opinions on mutual responsibility between parents and children.

[16] The statistical software used for clustering is SPAD, that produce cluster with a two step clustering [see Lanzetti (1995), 81-99)].

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From Digital Divide to Psycho-digital Divide: Elders and Online Social Networks

De la brecha digital a la brecha psico-digital: Mayores y redes sociales

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ABSTRACT

The present study analyzes the evolution of the concept of the digital gap with the elderly from the perspective of active ageing and in the context of the use of online social networks as a communication instrument. We consider that socio-demographic variables are not enough to explain the elderly's use or non-use of Information and Communication Technologies (ICT). Psychological variables, such as cognitive age, technology anxiety and the level of venturousness complement the former and can even explain more the elderly person's behaviour regarding the use of online social networks. The results come from a sample of elderly people who are students of an Experience Classroom in a university. They allow us to confirm that our doubts about the stereotype of the elderly concerning the digital divide are correct and that the psychological variables serve to a greater extent to show the significant differences with respect to determining their profile. The elderly user of online social networks feels younger, experiences a lower level of technology anxiety and is more adventurous. In general, psychological characteristics therefore offer a more discriminant power than those that are socio-demographic. This is why we propose the concept of a psycho-digital divide.

RESUMEN

En el presente estudio analizamos la evolución del concepto de la brecha digital para los mayores desde la perspectiva del envejecimiento activo y en el contexto de la utilización de las redes sociales como instrumento de comunicación. Consideramos que las variables socio-demográficas no tienen suficiente poder para explicar la utilización o no de las tecnologías de la comunicación (TIC) por los mayores. Las variables de corte psicológico, como la edad cognitiva, la ansiedad tecnológica o el nivel de audacia complementan a las anteriores, e incluso, pueden ser más explicativas del comportamiento del mayor con relación a la utilización de redes sociales. Los resultados provenientes de una muestra de mayores, alumnos del Aula de Experiencia de una universidad, nos permiten confirmar que nuestras dudas acerca del estereotipo de los mayores respecto a la brecha digital son acertadas y que las variables psicológicas sirven, en mayor grado, para mostrar las diferencias significativas existentes entre usuarios y no usuarios de redes sociales en cuanto a la determinación del perfil de los mismos. El usuario mayor de redes sociales se siente más joven, experimenta un menor nivel de ansiedad tecnológica y es más audaz. En general, las características psicológicas ofrecen, por tanto, mayor poder discriminante que las socio-demográficas, por ello proponemos el concepto de brecha psico-digital.

KEYWORDS | PALABRAS CLAVE

Elders, digital divide, active ageing, cognitive age, technology anxiety, venturesomeness, ICT, online social networks.
Mayores, brecha digital, envejecimiento activo, edad cognitiva, ansiedad tecnológica, audacia, TIC, redes sociales.

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1. Introduction

The Organisation for Economic Co-operation and Development (OECD, 2001: 5) defined the digital divide as «the gap or division between people, homes and geographic and economic areas with different socio-economic levels regarding both their opportunities of accessing Information and Communication Technologies and the use of Internet for a wide variety of activities». According to this organization, the digital divide in families basically depends on two variables, income and education level, as well as other socio-demographic variables such as race, gender, family type, linguistic limitations and age.

With respect to the elderly, the World Health Organization (OMS, 2002) defines active ageing as «the process of optimizing health, participation and safety opportunities with the aim of improving people's quality of life as they grow old». The term «active» suggests «a continuous participation in social, economic, cultural, spiritual and civic questions, not only the capacity of being physically active» (OMS, 2002: 79). In the current technological and globalized environment, Information and Communication Technologies (ICT) have a fundamental role, as noted by the World Economic Forum (WEF, 2011: 109). With the aim of promoting active ageing and diagnosing the real situation of the elderly in Spain, the White Paper on Active Ageing (Imserso, 2011a) and a Work Program (Imserso, 2011b) were created. In them appear as challenges, on the one hand, the developing of models of co-existence based on the increase of personal contacts, social networks and the use of new technologies and the encouragement of inter-generational relationships and, on the other hand, an advance in the use of ICT by the elderly (Imserso, 2011b).

The use of ICT by the elderly is a complex subject. There is the stereotype that the elderly are cut off from new technologies. Many studies (Chua, Chen & Wong, 1999; Dyck & Smither, 1994) state that the age of an individual is a variable which conditions their use of ICT. Nevertheless, there is other research (Mathur, Sherman & Schiffman 1998; Ramón, Peral & Arenas, 2013) which reveals that this segment is very heterogeneous. Not only age, but sex, the education level and the socio-economic class influence explain the elderly's digital behaviour. This is what we may call the socio-digital divide.

The aim of this work is to question the stereotype of the elderly regarding the digital divide. Its justification is determined by the heterogeneity of the elderly in their behaviour with new technologies. On the other hand, the traditional definition of the digital divide differentiates between users based on socio-demographic characteristics. However, the use of these variables may be insufficient to understand more thoroughly the motivations which lead the elderly to use ICT (Dabholkar & Bagozzi, 2002). We believe that the digital divide continues to exist, but it is evolving toward other aspects which are inherent to the individual. This is why we propose psychological criteria which better reveal the differences which exist among the elderly, specifically their influence on the use of social networks.

In a hyper-connected world, active ageing can be seen to be favoured by the use of social networks (WEF, 2011). Research on this topic has not yet been developed. Fritsch, Steinke and Silbermann (2013) in their bibliographical review, find only eight articles focused on people over 50 and social networks. The majority of these works are centred on safety and privacy as the main obstacles to using them. Others, such as Pfeil, Arjan and Zaphiris (2009), analyze the relationships built in social networks based on age, observing that the elderly have a greater diversity of ages among their contacts (despite their number being fewer), among which are included family members as opinion leaders in social networks. The work of Ji, Choi, and Lee (2010) proposes the identification of the profiles of elderly users and non-users of social networks and the differences in their behaviour. This leads us to consider possible segments of users who will more easily access other forms of online communication which are more oriented toward e-commerce and its different forms of social commerce (Liébana, Villarejo & Sánchez-Franco, 2014). Finally, the work of Curran and Lennon (2013) considers the influence of sociological variables, such as social influence and social tension, on the intention to use social networks among the elderly.

Psychological factors explain the development of expertise and skills in the elderly. These will favour the use of social networks and will enable the optimizing and prolonging of their use as they grow old. This is because they are an instrument of communication which will allow the achievement of levels of well-being and benefits for health care and the improvement of self-sufficiency (Leist, 2013). The social interaction that the elderly attain when they take part in social networks keeps them in communication, active and constantly learning. They thus solve technological challenges individually or supported by the advice of family members and younger friends who have a greater experience in the digital context (Braun, 2013).

In the analysis of individual differences, we consi-

der those related to demographic characteristics, such as sex and age, and psychological characteristics. In our study, within the last of these we have gone deeply into the cognitive age, setting out from the works of Barak (Barak, 2009; Barak & Gould, 1985; Barak, Guiot, Mathur, Zhang & Lee, 2011), given that this is a variable that is habitually used in studies about the elderly and which reveals the existence of differences between chronological age and cognitive age. On the other hand, the other psychological variables proposed, technology anxiety and venturousness begin with the works of Meuter & al. (2003) and Niemelä (2007) which have been used in research on the acceptance and use of technology, such as Venkatesh & al. (2003).

The structure of the work begins with the bibliographical review of the defining psychological variables in the behaviour of the elderly in social networks: cognitive age, technology anxiety and adventurousness. As a result of the literature review we make a research proposition. In the second section we describe the material and methods used. We finish by analyzing the results obtained and summarizing the study's main conclusions.

a better understanding of the decisions of elderly users (Sudbury & Simcock, 2009a) and their responses to the stimuli of communication (Moschis & Mathur, 2006), given that it expresses better identity, perceptions and, therefore, the behaviour of each individual in the challenge of coping with the use of ICT.

As Barak and Gould (1985) point out, the cognitively young elderly are more adventurous, have greater self-confidence and are selective innovators, as they accept new practices and products when they feel that they are going to benefit from them. This is why a lower cognitive age may mean for the elderly an antecedent about the use and acceptance of technologies (Wei, 2005).

The more adventurous elderly and those with a greater technology-related self-confidence are, in a statistically significant manner, those who use social networks, create accounts and are also in more than one social network. On the other hand, those elderly people who are more afraid when they use technology are those who use social networks less.

1.1. Cognitive age

Each person perceives his/her maturity based on the social and cultural stereotypes, of the social reality in which they live and their own psychological and physical changes which they have developed while getting older (Peters, 1971). The over-50s currently feel younger than their chronological age (Sherman, Schiffman & Mathur, 2001), rejecting descriptions such as aged or old (Mathur & al. 1998), as well as the image that advertising at times projects about them (Moschis & Mathur, 2006).

The term cognitive age appears in this context. This is part of the self-concept which people have of themselves. The perception of cognitive age is influenced by the chronological age but also by the life experiences and changes in social roles (Mathur & Moschis, 2005). This cognitive age positively influences self-esteem and confidence in the capabilities that one believes one has (Barak & Rahtz, 1990).

In this sense, cognitive age is a better criterion to segment the market (Barak & al., 2011; Mathur & Moschis, 2005; Reisenwitz & Iyer, 2007), as it enables

Hong, Lui, Hahn, Moon and Kim (2013) divide the elderly into two groups –those with a cognitive age the same as their chronological age and those with a cognitive age lower than their chronological age– to compare the influence of factors of acceptance of mobile data services. However, Szmigin and Carrigan (2000) indicate that the elderly feel increasingly happier and confident concerning their capabilities and do not need to feel or appear younger than their real age. Indeed, Teuscher (2009) finds that the differences between cognitive age and chronological age are fewer than those revealed in previous studies (an average of 5.6 compared to fifteen years). Nonetheless, we understand that the cognitive age and its difference with respect to the chronological age can help us to understand the variations which are produced in the acceptance and use of social networks.

1.2. Technology anxiety

The first research about anxiety was centred on that produced by computers (Meuter & al., 2003).

This was considered to be an example of the state of anxiety (Chua & al., 1999), that is to say, a transitory state or condition which varies in intensity and fluctuates over time. Nevertheless, anxiety as a feature of an individual's personality is a predisposition in their behaviour to perceive a set of objectively non-dangerous circumstances as a threat (Spielberger, 1966). In accordance with the classical theories about anxiety, it is considered that it induces negative impacts in the individual's cognitive responses (Guo, Sun, Wang, Peng & Yan, 2013) and can mainly be modified by training and experience with computers.

A less studied concept is that of technology anxiety (Niemelä, 2007) derived from the former (Guo & al., 2013). The effects of technology anxiety are especially strong in the first phases of the process of adopting a new technology (Venkatesh, 2000), when people use it for the first time, and even before doing so and especially in public (Gelbrich & Sattler, 2014). Technology anxiety is the main determiner of the use of a technology at an individual level (Meuter & al., 2003). Furthermore, another of its consequences is resistance to change, given that those people with high levels of technology anxiety tend to be more worried about the unexpected mistakes caused by the technology, which is why they will try to maintain the initial status quo (Guo & al., 2013).

Various studies (Dyck & Smither, 1994; Guo & al., 2013) have maintained the stereotype that the elderly have higher levels of technology anxiety and less self-confidence than younger people. Yet, Niemelä (2007) on the elderly belonging to the baby-boom generation does not agree with this idea. Given that nowadays the elderly have grown up with the birth of new technologies such as cell phones and Internet, they differ from previous generations in their experience with them. Their greater use and experience with technology enables the elderly of this generation (currently between 59 and 69 years old) to have lower levels of technology anxiety. Recent studies (Agudo, Pascual & Fombona, 2012) indicate that the elderly mainly use technologies with the aim of communicating, learning and facilitating their daily and leisure activities.

1.3. Venturousness

Adventurous people exhibit more daring behaviour but are aware that there is a risk involved in their decisions. The desire to try out new and exciting things is associated with the individual's intrinsic motivations toward stimulation, knowledge and achievement (Clarke, 2004). Moreover, venturousness can be related to the locus of internal control (Chantal & Vallerand, 1996). That is to say, the subjects perceive that the facts which occur in their life are the effects and consequences of their decisions, so they like to face challenging experiences. As Rogers (2003) points out, venturousness is almost an obsession for innovators. Therefore, it is to be expected that the people who have this dimension of their personality will be involved in new and challenging activities, such as those related to technology.

There are few articles which relate venturousness with the acceptance or use of ICT, and less among the elderly. Siu and Cheng (2001) study the adoption of e-commerce considering different characteristics, finding that adopters reflect a greater level of venturousness than non-adopters, are more predisposed to taking risks, as well as being more interested in technological developments. Regarding the elderly, Sudbury and Simcock (2009b) carry out a segmentation of 650 British people between 50 and 79 years old, using behaviour variables to explain why elderly people show less innovative behaviour than younger people (Dean, 2008). The results indicate that an adventurous character enables differentiation among the elderly. Thus, the segment called positive pioneers has high levels of venturousness, as due to curiosity they like to buy and try out new things, they like to be the first to do so, to comment about it with their friends and to share information.

1.4. Research proposition

To sum up, we establish as a research proposition that the psychological characteristics of people –in this case the elderly– provide a better explanation of the digital divide than the traditional socio-demographic variables. Based on the review of the previous literature, it is expected that the elderly who use social networks more are not differentiated by their socio-demographic profile but are characterized by a lower cognitive age, as they have less technology anxiety and are more adventurous.

2. Material and methods

The sample used comes from students who had enrolled in the Experience Classroom of the University of Seville. Its aim is to give an opportunity to people over 50 who wish to access education and general culture, becoming a forum of socio-cultural coming together and encouragement. The data were gathered in November and December 2013 via a survey carried out during class hours. To eliminate possible ambiguities, the questionnaire was revised previously with seven voluntary students.

The refined questionnaire brought together the socio-demographic and descriptive variables of the use of technology and the measurement scales of the psychological variables used. The cognitive age and the desired age were measured with the scales of Barak and al. (2011). This is a scale expressed in decades that gathers four dimensions in which people indicate the age which they feel that they have, the age which they feel that they show, that which their actions reveal and that which their interests show. On the other hand, the desired age reflects what people aspire to be, their ideal self-conception that their dimensions are the same as the cognitive age, beginning with the conditional «I would like…». The average of each four values is what determines the cognitive age and the desired age.

On the other hand, the scale of Meuter & al. (2003) was used to identify venturousness. For technology anxiety we follow the scale proposed by Niemelä (2007), which identified two factors within this construct: the first categorised fear of technology and a second which gathers self-confidence in the use of technology. These three variables were measured via a seven-point Likert scale.

To analyze if the variables linked to social networks are related with the individuals' characteristics we carried out the appropriate statistical tests. Thus, we used a one-way ANOVA in the cases in which the variables to be analyzed were categorical (e.g., having or not having an account in social networks) and another in a scale (e.g., chronological age); Pearson's correlation if the two variables were of a scale; and Cramer's phi correlation in the case of two dichotomous variables.

3. Analysis and results

A total of 474 questionnaires were first obtained. These were refined by eliminating those which were not correctly filled out and 415 valid surveys were obtained. A study of the sample's socio-demographic variables indicated that 62.5% were women, the average age was 63.6 and 57% of the respondents were married. The majority level of studies was secondary school (54.2%), followed by university (36.1%). The social class was mainly middle class (80.2%) and 78.4% of the sample were retired.

Regarding social networks, 51.2% of the sample's elderly people had used one social network and 77.6% had created an account. 44.1% had an account in a single network, 14.2% in two and 5.1% in three. This explains that when adding up the use of social networks, the result is greater than 100: 93.1% used Facebook, 26.7% Twitter, 6.7% Tuenti and 22.7% used other social networks. The most frequent activities carried out in the networks were: making comments (64.6%); posting photographs (42.9%) and chatting (35.5%). These activities took place at least once a month.

The results (Table 1) comply with the pattern found by Barak (2009) in 18 countries, none of them Spanish-speaking, (desired age <cognitive age<chronological age), with a greater variation in the answers of the desired age. The average of the cognitive age and the desired age is less for women (48.66 and 39.04 years old for women and 53.57 and 42.38 for men, respectively), in a statistically significant manner (significance less than 0.05 of the t-test for differences in means for independent samples), as was found by Eastman and Iyer (2005) and Wei (2005).

The results (Table 2) do not support a relationship between the socio-demographic characteristics such as sex, social class, the education level or being retired or not and the use of social networks. The chronological age is, however, related to the use of social networks online and having an account, so that the younger elderly are the ones who use them more.

With respect to the cognitive age, only the number of social networks used is significant, showing that those who feel younger use a greater number of them. Nevertheless, we consider that the value of the cognitive age attains a greater significance when it is compared to the age that the person really has. This is why, following Hong & al. (2013), we divide the elderly into two groups: those with a cognitive age the same as the chronological age (people who feel they are their age) and those with a cognitive age lower than their chronological age (people who feel that they are younger). There were no people who felt that they were older than their chronological age. Having an account in a social network and using a greater number of social networks has a statistically significant relation with the fact of feeling younger.

To study the other three psychological characteristics, we analyzed the Cronbach alphas. In the three cases, we obtained values much higher than the required minimum of 0.7: 0.907, 0.95 and 0.97 for being adventurous, having self-confidence and technology fear, respectively. This confirms the reliability of the scales used.

Table 1: Description of the sample's ages

	Average	Variance
Chronological age	63.32 years	35.84
Cognitive age	50.63 years	60,17
Desired age	40.35 years	101.18

The more adventurous elderly and those with a greater technology-related self-confidence are, in a statistically significant manner, those who use social networks, create accounts and are also in more than one social network. On the other hand, those elderly people who are more afraid when they use technology are those who use social networks less.

4. Discussion and conclusions

The results enable us to confirm that, as we proposed in the main aim of this work, our doubts about the stereotype of the elderly regarding the digital divide are correct. Though it is true that we have found differences among the elderly regarding the chronological age, doubtlessly due to the implications which it may have in other physical and cognitive aspects, we find empirical arguments to propose that the new digital divide is linked to psychological factors– what we have called the psycho-digital divide –especially if we analyze specific segments of the population, such as the elderly (Chua & al., 1999). If we were to analyze all the ages of the Spanish population, the contributions of socio-demographic variables could have more meaning.

Firstly, concerning the stereotype of the elderly, our results confirm in the Spanish society the findings of Mathur and al. (1998) and Schiffman and Sherman (1991) in the United States; Sudbury and Simcock (2009b) in the United Kingdom; and Hong and al. (2013) in Hong Kong. They found a high heterogeneity among the elderly. The image of the elderly is based on an obsolete prototype (Teuscher, 2009) which comes from that of previous generations concerning their forebears. The elderly are more to be found among the late adopters of a technology than in the segment of pioneers (Chen & Chan, 2014). Notwithstanding, the heterogeneity among the current elderly provides different archetypes, many of which of very far from the initial stereotype.

Secondly, concerning the definition of the digital divide, our results show that socio-demographic variables do not serve to differentiate among the elderly regarding their use of social networks. As we proposed, other characteristics, which are inherent to the individual, enable the identifying of differences in the use of social networks. We have identified that the profile of elderly users are those who feel younger, experience less fear, feel more confident and have a greater level of venturousness. Our results consolidate, and are in line with, those reached partially by other researchers in the last two decades. For instance, as a result of the use of the cognitive age in the case of the elderly, Mathur and al. (1998) find a group which they call «new age» elderly, characterized by their perception of being younger –at least ten years younger than their chronological age– and whose behaviour is in many ways similar to that of younger people. Indeed, they are convinced that age is a mental state which has little to do with the chronological age (Schiffman & Sherman, 1991). According to Barak and Gould (1985), these elderly people are more self-confident and are more adventurous. Furthermore, they exhibit behaviour which is oriented toward knowledge, as they reveal that they have recently acquired knowledge (Teuscher, 2009). Sudbury and Simcock (2009b) identify positive pioneers as being those who have a lower chronological and cognitive age, are those who perform more activities and have more social relationships, are more present on the Internet and, especially, are less concerned what others think about them. In the light of the results of other studies, we believe that this segment –adventurous, innovative, technology pioneers and inclined to share with friends, and whose difference between their chronological age and their cognitive age is greater– seems to be the segment given to using social networks. In our case, we have identified that 15.6% of our sample have used social networks, feel younger, are adventurous, are self-confident when they use technology and are not afraid to use it. 11.3% of the elderly fulfill these requirements and have accounts in social networks.

We indicate various implications from the practical

Table 2: Summary of relations between the variables

	Sex	Social class	Education level	Retired	Chronological age	Cognitive age	Feel young	Adventurousness	Technology fear	Technology self-confidence
SNS use	n.s.	n.s.	n.s.	n.s.	Sig. (1)	n.s.	n.s.	Sig. (1)	Sig. (1)	Sig. (1)
SNS account	n.s.	n.s.	n.s.	n.s.	Sig. (1)	n.s.	Sig. (3)	Sig. (1)	Sig. (1)	Sig. (1)
How many SNS	n.s.	n.s.	n.s.	n.s.	n.s.	Sig. (2)	Sig. (1)	Sig. (2)	n.s.	Sig.(2)

n.s.: not statistically significant
Sig.: statistically significant at 95%. (1) one-way ANOVA (2) Correlations (3) Cramer's phi

point of view. Firstly, given that one of the main barriers continues being technology anxiety, and that this is a state, it can be overcome with the training and experience of the elderly. One way of tackling it is to do what some companies do, which is to allow their potential customers to experiment with new products (Gelbrich & Sattler, 2014), or, like McAfee, which offers its programme «Online Safety for Silver Surfers», an initiative with which their employees teach the elderly how to browse the Internet safely, protecting their data. Secondly, it is necessary to encourage self-confidence with technology and for the elderly to see themselves as capable of its daily use. Self-confidence is a decisive factor in the motivations and behaviours of people and reduces the anxiety related to using new technology (Zhao, Matilla & Tao, 2008). Thus, the Fundación Vodafone (Vodafone Foundation) points out that some elderly people state that they are strongly motivated to learn to function in social networks. Thirdly, it is necessary to promote the advantages of social networks for the elderly as a means of communication and social participation. In this way, the Ministry of Health, Social Services and Equality, and Imserso are reinforcing their presence in social networks via the implementation of Web 2.0 technologies which facilitate the participation of the elderly through these tools.

To finish off, we wish to highlight that the sample used in this work comes from an Experience Classroom, which may influence the bias of this sample. Nevertheless, we have found differences in the behaviour of the elderly regarding social networks. The choice of this population of university elderly people can be justified by its use in previous research related to the use of ICT (Martínez, Cabecinhas & Loscertales, 2011). To broaden the sample to other contexts would increase the heterogeneity of the people, which would strengthen the conclusions proposed.

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A Mobile Augmented Reality Assistive Technology for the Elderly

Tecnología asistencial móvil, con realidad aumentada, para las personas mayores

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ABSTRACT

Modern technology offers many facilities, but elderly people are often unable to enjoy them fully because they feel discouraged or intimidated by modern devices, and thus become progressively isolated in a society where Internet communication and ICT knowledge are essential. In this paper we present a study performed during the Nacodeal Project, which aims to offer a technological solution that may improve elderly people's every day autonomy and life quality through the integration of ICTs. In order to achieve this goal, state-of-art Augmented Reality technology was developed along with carefully designed Internet services and interfaces for mobile devices. Such technology only requires the infrastructure which already exists in most residences and healthcare centres. We present the design of a prototypical system consisting of a tablet and a wearable AR system, and the evaluation of its impact on the social interaction of its users as well its acceptance and usability. This evaluation was performed, through focus groups and individual pilot tests, on 48 participants that included elderly people, caregivers and experts. Their feedback leads us to the conclusion that there are significant benefits to be gained and much interest among the elderly in assistive AR-based ICTs, particularly in relation to the communication and autonomy that they may provide.

RESUMEN

Las posibilidades que ofrecen las tecnologías son muchas, sin embargo, las personas mayores son a menudo incapaces de disfrutar de ellas plenamente, sintiéndose desanimadas o intimidadas por estos nuevos dispositivos. Esto les lleva a un progresivo aislamiento en una sociedad donde es esencial conocer las distintas formas de comunicación a través de Internet y las TIC. En este trabajo presentamos un estudio realizado durante el proyecto Nacodeal, cuyo objetivo es ofrecer una solución tecnológica para proporcionar autonomía y una mejor calidad de vida para las personas mayores durante sus actividades diarias mediante la integración de las TIC. Para lograr este objetivo se ha desarrollado tecnología puntera en realidad aumentada (RA), así como servicios de Internet e interfaces para dispositivos móviles especialmente diseñados para personas mayores. Estas tecnologías emplean la infraestructura presente en la mayoría de casas y centros de cuidados de mayores. Presentamos un prototipo de sistema compuesto por una tableta y un dispositivo de RA portátil, así como el análisis del impacto social en la interacción con usuarios y la valoración de la aceptación y usabilidad. Esta evaluación se llevó a cabo a través de grupos focales y pruebas piloto individuales con 48 participantes: ancianos, cuidadores y expertos. Sus comentarios concluyen que existen fuertes beneficios e intereses por parte de las personas mayores en las TIC asistenciales basadas en RA, especialmente en los aspectos relacionados con la comunicación y autonomía.

KEYWORDS | PALABRAS CLAVE

Assisted living, augmented reality, ICT, media literacy, cognitive stimulation, elderly people, learning.
Vida asistida, realidad aumentada, TIC, alfabetización mediática, estimulación cognitiva, personas mayores, aprendizaje.

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1. Introduction

Today, everybody agrees that we live in a society which is constantly evolving and which has become increasingly dependent on the use of new technologies to fuel this change. Such constant changes affect the members of society since there is an implied cost of adapting to all new habits and practices (time, effort etc.). In many ways, both the growing pace and the amplitude of this change has led to a widening of the gap between members of society who adapt and those who have difficulties adapting. Citizens aged 65 or over - the elderly - suffer from the added limitations that come with the aging process. Moreover, the stereotypical view relating age to resistance to change and inability to learn new approaches is detrimental to their integration and living quality in an increasingly digital society. This poses a serious social problem, pronounced by a marketing tendency towards a young audience or a focus on users with technical expertise (Prensky, 2001), and is further aggravated by the increased degree of social isolation that comes with age.

According to the Eurostat report of 2014 (European Commision, 2014), the number of elderly citizens in the European Union already constitutes 18.2% of the population, and is expected to increase to 31.3% within 20 years. Italy, in particular, is the European country most affected by these issues: approximately 250,000 Italians are affected by Alzheimer´s disease and a comparable amount with dementia (Chiatti, 2013), underlining the need for continuous assistance by carers and ICT devices.

Contrary to some common beliefs, elderly people are aware of the importance and benefits of ICTs, regardless of gender or degree of studies, as evidenced by studies by Agudo, Fombona and Pascual (2013: 131-142). It was observed that ICTs are mostly used for social and entertainment purposes such as contacting friends and family members, or creating-media content (Agudo, Fombona & Pascual, 2012). Moreover, elders show a good acceptance of multimedia applications such as videoconference/calls and online video to complement their daily activities.

A novel form of delivery of media content and interaction towards assistive technologies is Augmented Reality (AR).This approach consists of the superimposition of some animation or image in a realistic way, over an image captured by a digital camera. This technology has been recognized by educational researchers as a powerful interactive tool (Wu, Lee, Chang & Liang, 2013) for tasks such as visualization of complex structures (Arvanitis & al., 2009), educational games (Rosenbaum, Klopfer & Perry, 2007), and design-based learning (Bower, Howe, McCredie, Robinson & Grover, 2014), resulting in increased student motivation. Usually, this content is delivered through computers, tablets or mobile phones, and such functionality has been incorporated into some assisted living systems (Avilés, Villanueva, Garcia-Macias & Palafox, 2009). Still, the acceptance of such technology, as pointed out by Hernández-Encuentra, Pousada and Gómez-Zuñiga (2009: 226-245), is not a mere matter of usability or design: the technology shouldn't only be a tool to replace what had been lost, but rather a tool for personal development.

One important observation of their work is: «It can be concluded that the adaptation of ICTs to elderly users is necessary, but that in itself does not mean that they will use the technology. The device must be customized, modulated and scaled specifically for an older population in which the inter-individual variability is increasing». This flexibility towards the individual necessities of the elderly is an essential part of the design of new technologies.

Computers and tablets require constant interaction and manipulation, which can make them unsuitable as a medium of content delivery for the elderly (Kurz, Fedosov & al., 2014; Almeida, Orduña, Castillejo, López-de-Ipiña & Sacristán, 2011; López-de-Ipiña, Klein & Perez-Velasco, 2013). The Sixty Sense project (Mistry & Maes, 2009) showed that realistic visual cues can be added into a user's surroundings by using AR together with a portable camera and a pico projector, and this can provide a promising approximation towards interaction with the user. Progress in AR and Simultaneous Localisation and Mapping (SLAM) methods (Henry, Krainin, Herbst, Ren & Fox, 2012; Engel, Schöps & Cremers, 2014) has removed the need for the introduction of AR markers and the adaptation of the environment for their usage.

The rationale behind the Nacodeal (Natural Communication Device for Assisted Living) project is the development of a new type of Assisted Living system for elderly people with an aim to increasing their social integration through ICTs. A guidance and communication service is provided by using two devices. The first is a tablet incorporating software developed for the end user's needs and requirements, customizable and accessible to different user categories. The second is a new kind of Augmented Reality technology (Saracchini & Ortega, 2014): a wearable device with an embedded pico projector and camera which locate the user position and orientation by using a 3D map of the environment, projecting information realistically (figure 1).

Using this technology, it is possible to create friendly guides so that its users will be capable of performing their daily activities and accessing online services which are relevant to them. In order to satisfy these conditions, the following requirements were established:

Figure 1. Conventional AR (left) , information is exhibited on a display. On-site AR (right), information is projected and observed in the environment.

- The system has to determine the user location and the AR device orientation in real-time, exhibiting content autonomously.
- It must be viable for health-care centres or residences without relying on a complex infrastructure or expensive equipment.
- The end user should interact with the system through a mobile interface (tablet), tailored to his/her cognitive levels.
- It must act as a bridging tool between ICTs, the end user and his/her family, and caregivers without changing the user's routine or reducing mobility.
- It should produce minimal changes in the environment, and not require elements such as AR markers.

These requirements should not be attained by Wi-Fi or RFID triangulation, since they do not provide precise positioning and orientation of a portable device, and also tend to require a complex and expensive infrastructure.

- Visual SLAM/AR approaches can fulfil these requirements using off-the-shelf components such as Webcams and computers.

In order to assess the efficacy of the proposed system, a study was made with elderly volunteers, caregivers and specialists from Italian health-care centres, aiming to determine the benefits in their social interactions, as well any desirable characteristics regarding content, functionality and usability. The next section will offer an overview of the Assisted Living system and details of the validation process.

2. Design and validation methodology

2.1. The assisted living system

The assisted living system was designed to use a resource available in most residences and public spaces: a wireless Internet access point. Its components are separated in two main groups: the remote infrastructure, a Web-based service that manages the content to be exhibited by the system and the local infrastructure, which is the hardware installed in the healthcare centre or residence, and the interfacing devices which interact with the end-user (figure 2).

The system has been designed taking into account two main factors: the content creator and the end user. The content creator is responsible for creating and programming the multimedia content to be displayed by the assisted living system. This person (or group

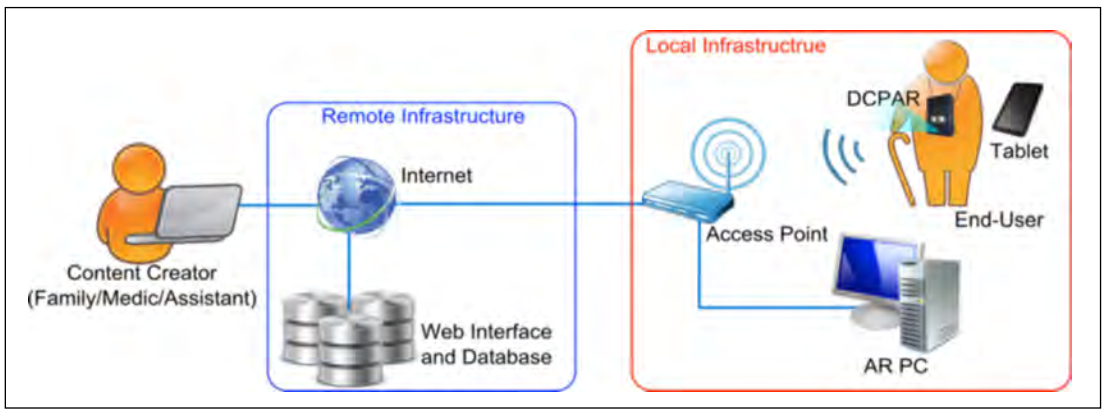

Figure 2. Design of the experimental Assisted Living system.

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of people) can be a caregiver, doctor, relative or behavioural specialist, interacting with the system through a Web-interface accessible through a computer or smart-phone. The end user is the elderly person, to whom this content will be delivered through the tablet and the wearable AR device, denominated DCPAR (Device with Pico Projector for Augmented Reality) (figure 3).

A core concept of this design is that neither actor requires more than the knowledge necessary to use common house appliances. The content creator needs to know how to navigate a standard Web-page, create or edit digital pictures, presentations and movies, or at least submit already created content. The end user is required to have only basic knowledge of how to use the tablet features and no technical knowledge in order to receive AR content. Due to the wireless capabilities of the devices, the end user is not obligated to stay in a single place as he/she would if using a personal computer. This enables him/her to conduct his/her daily routine with as little interference as possible.

• Web-interface and Database. The main purpose of the Web-Interface is to enable authorized content creators to upload media content and determine where and in what context AR content should be displayed. This data will be stored in a remote database, which will be accessed by the components of the local infrastructure. Some potential services to be delivered are personal agendas and calendar, messaging, VoIP calls and online chats, newspapers, magazines, memory exercises and information about personal therapy, educational videos about subjects of interest (culinary, handcraft work, etc.), maps with advice about potential hazards, and content produced by relatives such as videos, pictures or music.

The content creators can personalise the services according to the user's needs and habits. Furthermore, each area, with the related services offered, has been designed based on user requirements collected thanks to a specific analysis of the contents (De-Beni, 2009; De-Beni & Carretti, 2010).

• AR PC. The Augmented Reality PC is a dedicated computer connected to a wireless access point. It acts as the system processing centre, not limited by the weight, energy consumption or ergonomic constraints of typical mobile devices. The AR PC automatically distributes video and audio content to be transmitted to the tablet and the DCPAR devices in real-time, monitoring the database at determined intervals in order to retrieve changes in programmed schedules. It is also responsible for the execution of algorithms for Augmented Reality, environment recognition and determination of DCPAR orientation by processing the data transmitted by its camera. Other services, such as facial recognition or behaviour analysis, can be added through software updates, avoiding hardware replacement. This component is designed to be highly automated, and initializes the entire content exhibition just after being turned on like a common house appliance. In environments with multiple end-users, such as a health-care centre, the system is managed by an operator such as a nurse or gerontologist.

• Tablet. This is a consumer tablet containing intuitive software with an orientation support system constructed according to the criteria of ROT (Reality Orientation Therapy), aimed at supporting people with cognitive problems. This therapy allows stimulating the users throughout the day, through continuous information relating to their personal data, space and time. It facilitates the construction of coherent cognitive representations, allowing better understanding of the context that surrounds the user and the role that he/she has. The software interface aims to simplify the user's navigation inside the services and applications and to continuously stimulate their memory. The tablet holds four main applications: Calendar, Talk, Games and Entertainment. Each field represents a dedicated service, promoting the elderly person's brain activity during its use and helping him/her to remember appointments and daily activities.

Figure 3. Interface devices: the tablet (left) and the DCPAR prototype (right).

• DCPAR. The DCPAR prototype is a wearable device containing an embedded camera, a pico projector and a wireless transmitter housed in a 10x14x3 cm casing with straps which go round the neck. Although it is specialized hardware, low cost components have been used in order to achieve affordability. The device acts as an input-output video stream device, transmitting the environment visualised by the camera, which is processed by the AR PC, thus allo-

wing the generation of an image. This allows the automatic exhibition of media advice associated with each given location. For instance, when the user approaches a stove, it projects a warning about the potential hazard. More interactive content can be programmed, for example a guiding arrow adjusted in real time, depending-on user location.

• Installation. The wireless access point and AR PC use the network available at the place of installation and are positioned where there is good wireless coverage. To ensure that the Augmented Reality, recognition and localization algorithms function properly, a 3D map of the environment has to be prepared in advance. This step is done using a specialized software (Saracchini & Ortega, 2014) run through a laptop connected with a depth sensor such as the Microsoft Kinect, which scans places of interest. A 3D map is then generated and stored in the database, where the content creator can configure the AR programming according the user needs. The scanning procedure takes no longer than one or two hours, depending on the size of the scanned area. Once completed, the Assisted Living system is ready to use. Significant changes in the environment, such as if the walls are repainted, or if furniture is moved or replaced may require re-scanning, since the localization system is based on visual cues.

2.2. Validation with users

In order to effectively assess the proposed design, it is necessary to analyse its usage with elderly users, determining points of failure and inadequacies to their necessities in order to establish any concrete benefits brought to their routine. One of the key contributions to be analysed is the reduction of social isolation, and the improvement in socialisation, integration and interaction with elders affected by temporary memory loss. Taking this factor in consideration, our tests had been carried out in group sessions and individual pilots in rest homes and health-care centres located in the province of Ancona, Italy.

The user validation phase of the system has been structured in 2 steps: a focus group that involved elderly users, caregivers and experts (test performance phase 1) and individual pilot sessions in real scenarios (test performance phase 2).

The first part of the test –the group session– was aimed at comprehending the point of view of elderly people concerning the two components of the Assisted Living system, using one focus group for each facility in order to support the subjects approximation to this new technology and make it easier for them to understand the services and applications installed. The functions and features of the devices were explained during the sessions, and some initial feedback was retrieved. A group of experts was invited to evaluate the devices and interaction with the elderly users. As a non-medical preventive tool, the system does not target patients who suffer from serious cognitive trouble, and the Clinical Dementia Rating (CDR) scale (Herndon, 2006) was used as reference base during the selection process of participants. The tests targeted people from the scale CDR 0 to CDR 1 (table 1).

In the focus groups, the experts evaluated how the devices influenced social interaction and how each individual application of the device was able to offer autonomy, well-being and happiness. They also performed an assessment of which kind of application was preferred by the end users, and to what extent the use of social media produced new interest in the elderly. Other aspects such as the usability of the tablet and desired functionalities for the DCPAR were also evaluated.

The first focus group was in Chiaravalle, in the La Ginestra rest home, with a total of 12 participants among elderly, caregivers and experts. Seven volunteers participated as pilots, and two as observers. The expert team was composed of the coordinator of the residence, an expert in Alzheimer's disease and an operator responsible for recreational activities.

Table 1. CDR scale and associated cognitive status

CDR SCALE	COGNITIVE STATUS	DEFINITION
CDR 0	No cognitive impairment	Normal memory status, no memory loss or slight inconsistent forgetfulness. Person is fully oriented and can live autonomously. Able to maintain social relationships and intellectual interests and hobbies.
CDR 0.5	Questionable cognitive impairment	Slight forgetfulness with a partial recollection of events, but good orientation capabilities. Slight difficulty in solving problems and in social relationships. Slightly impaired autonomy and necessity of aid in home activities and in personal care.
CDR 1	Mild cognitive impairment	Moderate memory loss, more marked for recent events and interference carrying out everyday activities. Moderate difficulty with time orientation and some geographic disorientation. Incapable to carry out independently daily activities. Requires assistance in dressing, personal hygiene.

The second focus group was in Jesi, at the Victor Emanuele II residence. This group was composed of a greater number of participants, although most of them were simple observers (4 pilots and 8 observers). The devices and their usage were evaluated by the rest home coordinator, a member of Alzheimer Marche Association, a social-health operator, 2 operators responsible for recreational activities and a relative of one of the elders.

Table 2. Test performance phase 1 - Focus Group sessions

	LA GINESTRA	V. EMANUELLE	VISINTINI	TOTAL
Facility	Rest home	Rest home	Health-care centre	
Total of participants	12	18	5	35
- Elderly users involved in 2nd test session	7	4	2	13
-Observers	2	8	0	10
-Experts	3	5	2	10
-Technicians / Researchers	0	1	1	2

Table 3. Test performance phase 2. Individual pilots and CDR status

	LA GINESTRA	V. EMANUELLE	VISINTINI	TOTAL
Elderly users involved	7	4	2	13
CDR0	2	2	0	4
CDR0.5	3	2	1	6
CDR1	2	0	1	3

The third focus group was situated at Falconara Marittima in the Visintini residence, dedicated to patients suffering from Alzheimer's and senile dementia problems. This focus group was intended to evaluate the interaction of elders with more severe cognition issues, and was significant smaller than the others. The focus group was supported by the daily centre coordinator; a psychologist specialized in cognitive impairments and one volunteer from the centre.

The second session involved13 pilots: 10 women and 3 men with an average age of 80.3 years. Their physical and cognitive profile was also varied: six of them used wheelchairs due physical pain or infirmity, two had mild cognitive issues (CDR 0.5 and 1), and five had good physical and mental conditions. All participants resided on the tested facilities, except 3 of them: one resides in his own home and 2 others spend the day in the daily centre but return to a relative's home at night (tables 2 and 3).

3. Results

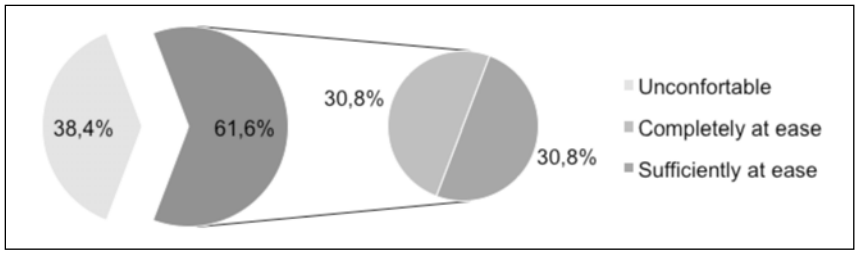
3.1. End-user feedback

Of the elderly users involved in the individual pilots, 30.8% felt completely at ease during the tests and 30.8% sufficiently at ease, thus providing 61.6% positive feedback. The remainder of the population (38.4%) felt uncomfortable, although no one rejected the devices completely. This reaction was considered quite normal with this kind of target due their unfamiliarity and certain degree of resistance towards their usage. See graph 1.

The feedback collected after the testing with the tablet was mostly positive and almost all of the elderly interviewed felt an initial embarrassment and insecurity followed by a feeling of curiosity and excitement. The elderly considered the tablet «a good tool to stay in contact with family and friends» with «easy access» and the ability to promote their «wellbeing and the sense of not feeling alone…». Many of them, after an initial resistance and fear toward the «new», learned to handle the tablet and DCPAR with familiarity. After understanding their functionality, they demonstrated enthusiasm and the will to learn much more about their functions. This progressive involvement was followed by a positive collaboration, but it also produced two critical issues: the problem of dependence on the devices and the management of the negative reactions and disappointment by the elderly at the end of the tests. The experts confirmed that the issue of «addiction» is typical in this kind of target, who are often lonely with few possibilities of social interaction or who live a monotonous life with low cognitive stimulation. Every form of involvement that enhances their memories is appreciated.

• Tablet. From the result of the survey, the elders evaluated their favourite service as the photo library (46.2%), followed by TV and video streaming (23.1%). A similar percentage (15.4%) was obtained for video calling and messaging functions and audio player. The participants showed little interest in the other applications. Their focus was in fact, directed on the content related to their relatives and friends. The agenda, especially, was considered too difficult to use by the participants with cognitive issues.

The participants desired to improve the photo album and music applications, especially regarding the

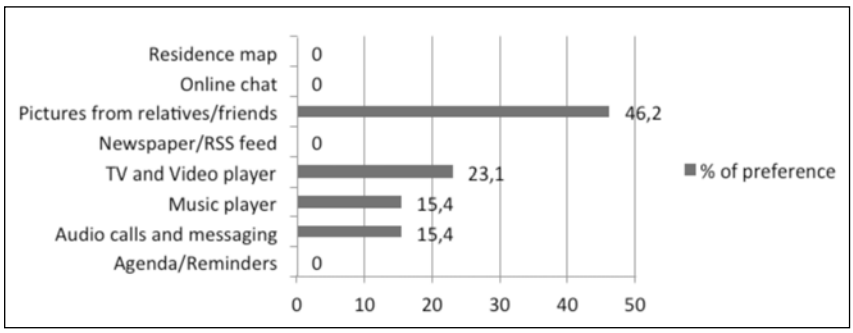


Graph 1. Degree of acceptance of the-devices during the focus group.

audio volume (hearing impairment) and image size (eyesight problems). They also manifested a wish for more multimedia content from their time, as well a more intuitive interface. See graph 2.

• DCPAR. In general, they felt the DCPAR bulky and heavy, sometimes having difficulties to understand its usage properly. However, most of them managed to use the tablet and AR functionalities with a high degree of autonomy. Regarding the device's functionality, the users were very pleased with its capacity to project images and movies from relatives or subjects of interest such as sport or religion. The device responsiveness was deemed suitable, adapting the projected image to the geometry of the environment properly. The most desired functionalities of the DCPAR were the active visualisation of content produced by their relatives and its use as agenda device, contrasting with the difficulties present in the tablet (graph 3).

A significant issue appeared regarding the device ergonomics: due the user's posture and pico projector inclination, the image projection was inferior to that expected. Also, it was deemed uncomfortable since it is worn around the neck, potentially increasing issues caused by arthrosis, common in people of advanced age.



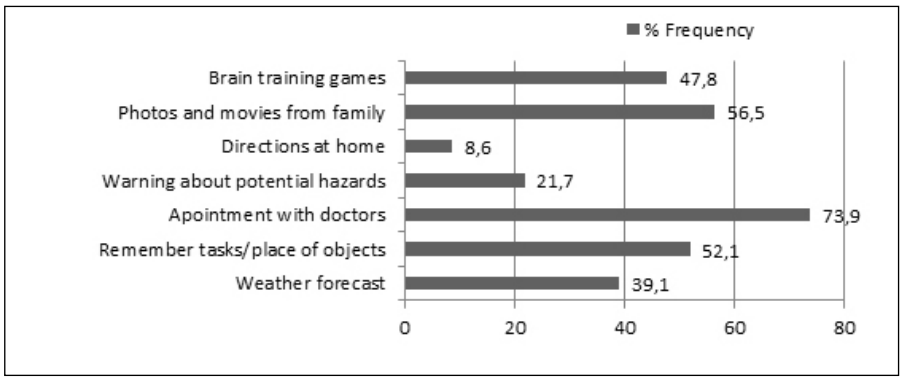
Graph 2. Favourite services provided by the tablet.

3.2. Carer feedback

The carers considered the Assisted Living system a useful tool, but overly complicated for independent use by an elderly person, especially if the user has cognitive or physical problems. This was reinforced by the testers and their families, whom suggested improvements in some details of the graphic interface, such as the «keyboard size» and a full involvement of the caregivers, «who must play a central role during the elderly people's introduction to and training with the new technology». They also suggested adding exercises to promote the association between places and images, in order to stimulate the spatial perception within the environments –facility or private home– and introduce the possibility to make video calls with relatives and friends.

According to the carers, the use of the proposed system may change based on the environment where it is used. In an elderly person's home it is useful for the memorization of appointments and events, as an alarm system for domestic dangers and obstacles, as a reminder to take medicines properly, as a phone system to communicate with their own social network, and as a stimulus to increase short term memory and personal interests. In a nursing home the system can improve the relationships among users as an entertainment device, it can help users remember their daily activities, and it can make it easier to identify objects present in the space through the association of the name made visible by the AR projections.

They observed how the DCPAR images were appreciated by the users wearing it and by the surrounding elders. It was also considered a stimulating tool for the mobility of the elderly. The testers felt compelled to investigate more, walking a lot during the pilots. As weak points, they identified its unsuitability for people with physical problems (e.g. elderly using wheelchairs) due to the viewing angle, and the difficulty of carrying it around for prolonged times. Furthermore they suggested the support of carers or



Graph 3. Frequency of requested DCPAR functionalities by elder users.

family members in managing user appointments and user personal profiles on the on-line database.

Finally the carers believed that the best way to encourage seniors in the use of the ICT devices was through an initial gradual approach process with the constant support of a «trainer» (e.g. a carer or relative). The approach that new technology needs involves people who have close contact with the users, since the users are much more collaborative with them than with strangers. Another interesting method to introduce seniors to the system could be through a more entertaining approach such as using educational games.

The experts who participated in the system validation consider the elderly people's involvement starting from the first phases to be fundamental in order to avoid their isolation tendency. It could also be an excellent tool for elderly with dementia diseases to support traditional non-pharmacological therapy, although in this case the users would need support from an operator.

4. Conclusions

The user-need analysis and the grade of acceptance of the proposed technology solution has highlighted how important it is for the elderly to stay constantly in contact with other people in order to positively stimulate their cognitive functions and prevent social isolation. The relational component has been carefully considered during the validation phase of the prototype in order to understand the real value of the tested technology and its ability to effectively influence the market.

The results showed that most of the elders want to be involved in the digital process, but with specific attention to their previous knowledge and experience that means a deep respect of their learning times. Most difficulties that arose were related to interface design and usability due to their specific cognitive requirements, and not to the level of interest or understanding of the elders regarding the ICT involved. This reinforces the notion that «these generations of the elderly need and want to learn, and see this moment in their lives as the right time to approach ICT (Agudo & al., 2012).

Augmented Reality plays an important role in the Assisted Living system, as it offers automatic context detection and the realistic introduction of information into the environment. In contrast to the tablet, the system is capable of interacting with users autonomously, adopting the role of «personal assistant», helping them achieve goals instead of deviating them from their usual routine. This improves their potential mobility, and the information provided for the elderly that suffer from temporary memory loss becomes an added –or «augmented»– value that is expressed through the most accessible channel to this target group: the association between experience and images. The matching between images and written/audio messages, according to experts in cognitive neuropsychology, promotes and stimulates the brain's activities and helps older people to maintain their memory in good health for as long as possible (Essay UK, 2006; Mazzucchi, 2008). The analysis made in this study produced valuable information towards designing a suitable AR device for elderly users. As pointed out by the users and experts involved, the prototype was too bulky and cumbersome. The device should incorporate a better ergonomic design and provide a simpler way of projecting an image in the field of view if there is to be continuous use and constant integration into the users' lives. In order to achieve this goal, further research in miniaturisation and ergonomics of portable computing devices should be carried out.

Further testing is needed on elderly people who live alone. Their necessities and points of view may differ considerably from those who have constant contact with caregivers, and our survey didn't cover this aspect. Currently, we are performing studies on volunteers under such conditions in order to measure the degree of impact that the proposed system may have on them.

It can be concluded that the proposed technologi-

cal solution presents an advance towards the introduction of ICTs to the elderly, with potential beneficial impacts on their lives. The tablet and the DCPAR have the potential to promote social interaction and virtually stimulate the cognitive process in the elderly, thus enhancing their self-sufficiency and quality of life. The system avoids being a mere tool to compensate losses or delegate functions, a factor that elderly people identified as being a negative effect of ICTs (Hernández-Encuentra & al., 2009). Instead, this technology has the potential to complement the process of personal growth at this stage of life by giving access to educational and entertainment content and by enabling seniors to overcome social isolation effects by keeping in touch with relatives, friends and society. In future research, improvements in this technology will be investigated with the following goals in mind:

• To provide the elderly who live alone the possibility to stay in contact with relatives and friends.

• To promote autonomy among the elderly through assistive and educational content.

• To increase the users' sense of safety and serenity through the possibility of implementing a call centre that can provide them with quick assistance.

By «augmenting» elderly people, there is increasing expectation that integrated AR technology in mobile devices will make their contact with ICTs and digital facilities a pleasant and natural experience. Progress in visualization and portable technology, such as the recently developed Google Glasses, and smart-watches supports the notion that ICTs have the potential to reach most members of society, regardless of age or gender.

Acknowledgments

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EyeTracker Technology in Elderly People: How Integrated Television Content is Paid Attention to and Processed

La tecnología del «EyeTracker» en adultos mayores: cómo se atienden y procesan los contenidos integrados de televisión

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ABSTRACT

Elderly people are major consumers of the media, especially of television, which combines conventional commercials with advertising formats included in the programme that do not break its continuity, unconventional advertising (UA). The aim of this study is to analyse how elderly adults, compared with young people, attend and process the information that appears on screen simultaneously (program and advertising). The study involved 30 elderly adults and 30 young adults. Attention to the TV screen (in terms of attention capture, heat maps and eye fixations) was analysed using the eye tracker technology. Content recognition, the level of psychological reactance to UA and channel-hopping behaviour were also analysed. The results show that the level of attention among the elderly does not differ from that of young people and depends on the integrated content. Recognition by the elderly is lower than among young people when the UA is of a high or medium level of intrusiveness. The psychological reactance of elderly adults is lower than that of young adults but both groups show the same behaviour in terms of loyalty to the television programme. The general conclusion is that cognitive ageing does not affect the capacity for attention to integrated content as much as it affects information processing skills.

RESUMEN

Las personas mayores son grandes consumidores de los medios, especialmente la televisión (TV), donde el spot convencional se combina con formatos publicitarios introducidos en el programa que no rompen su continuidad: la publicidad no convencional (PNC). El objetivo de este trabajo es analizar cómo los adultos mayores, en comparación con los jóvenes, atienden y procesan la información que aparece simultáneamente en la pantalla (programa y publicidad). Participan en el estudio 30 adultos mayores y 30 jóvenes. Se analiza, con la tecnología del «eye tracker», la atención dispensada a la pantalla de TV (en términos de captura atencional, «heat maps» y fijaciones oculares) mientras aparece PNC. También se analizan el reconocimiento de los contenidos, la reactancia psicológica ante la PNC y el comportamiento de zapping. Los resultados muestran que la atención de los adultos no difiere de la de los jóvenes y depende del contenido integrado. El reconocimiento de los adultos es inferior al de los jóvenes cuando la PNC tiene un nivel de intrusión elevado y medio. Su reactancia psicológica es inferior a la de los jóvenes, pero ambos grupos tienen el mismo comportamiento de fidelización al programa televisivo. La conclusión es que el envejecimiento no afecta tanto a la atención dispensada a los contenidos integrados como a las habilidades del procesamiento de la información.

KEYWORDS | PALABRAS CLAVE

Elderly people, attention, cognition, eye tracker, television contents, television advertising, neuromarketing, television habits.
Adultos, atención, cognición, eye tracker, contenidos televisivos, publicidad televisiva, neuromarketing, hábitos televisivos.

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1. Introduction and status of the issue

The elderly are an important segment of the market since they are major media consumers (Ramos & Mancebo, 2012a; 2012b), especially in the case of television (Ramos, 2014). The constant appearance of new formats and combinations of non-conventional publicity and the absence of experimental work on the processing that they trigger in viewers (Milajovic, Kleut & Ninković, 2013), especially in older adults, create the need to enquire into how these viewers take in and process the stimuli presented simultaneously on the screen. An elderly adult is considered to be an individual who is in the last stage of life; the age of the onset of this stage ranges from age 60 (WHO, 2014), 65 (Ramos & Mancebo, 2012) and 70 years. Although there are different paradigms that specify the meaning of old age, ageing is defined as a continuous, progressive, irreversible, heterogeneous, individual and social process, during which a cognitive decline appears, among other factors (Cabrera & Osorno, 2013). The objectives of this study focus on cognitive ageing.

Television content is usually presented in a sequential continuity consisting of programmes and commercial breaks. However, advertising is sometimes integrated into programming in non-conventional forms (Farré & Fernandez-Cavia, 2005) or special actions that do not break or alter the continuity of the programme. Integrated content on TV isconsidered to mean the simultaneous appearance of the programme together with Unconventional Advertising formats (UA in it); screen sharing, overlays and animations share the processing of the advert that the television viewer performs: they appear and disappear integrated into programming, with a high frequency and short duration:

-Screen sharing: a format during which the programme broadcast is divided into two parts, with one part showing (in a reduced size and with no sound) the continuation of the programme and the other the advertising block (with sound), which occupies most of the screen.

• Overlay or «banner»: a graphical advert in motion with text and image that appears on the screen, usually on the bottom, for a few seconds.

• Animation of visual symbols or «morphing»: a succession of images repeated sequentially that create the effect, in movement, of an image that usually corresponds to the channel logo.

The impact of these formats depends on the viewing they allow: the greatest being on the shared screen, medium in overlays and low in the animations (Añaños & Valli, 2012).

Unconventional advertising invades the screen, attempting to gain the attention of the viewers while they are watching the programme. Does it achieve its objectives? The theoretical approach for its explanation is the Flanker Compatibility Paradigm, according to which irrelevant stimuli obtain priority by activating involuntary attention by capturing attention. Lachter, Forster and Ruthurff (2004) call the processing of these stimuli (flanks) while the focus is directed elsewhere «Leakage». Flanks are processed similarly to distracting stimuli (Pedraja, Montoro & García-Sevilla, 2010) and can influence the behaviour of the subject (Pieters & Wedel 2004; 2007) according to exogenous or endogenous factors (Ruz & Lupiáñez, 2002; Botta & Lupiáñez, 2010; Santangelo, Botta & Lupiáñez, 2011; Pacheco, Lupiáñez & Acosta, 2009). Based on these authors, we consider that during the broadcast of integrated content on television, a pre-attention process is carried out in which the UA formats are captured visually as distracters while attention is focused on the programme. The level of attention capture will depend on the characteristics of the format and the subject. The attention paid will coincide with the first (pre-attention and unconscious) attention level proposed by Heath (2009) and Heath, Nairn and Bottomley (2009), with which the advert is explored. How can the effect of these distracters on attention be measured?

Visual attention is closely related to the sensory response of eye movement, and the «eye tracker» is a powerful technology for evaluating it (Altmann & Kamide, 2009; Brasel & Gips, 2008; Duchowski, 2013). Studies with older adults show that they have the same patterns of eye fixation as young people (Kemper, Crow & Kemtes, 2004) and that, although visual attention depends on the type of information focused on (Isaacowitz, Wadlinger, Goren & Wilson, 2006), by the age of 70 there is a stability of visual fixation (Kosnik, Fikre & Sekuler, 1986). The ocular fixations that older adults pay to a stimulus and to the distracters are similar to those of young people but their level of understanding is lower (Kemper, McDow & Kramer, 2006), since they are less able to recognise and differentiate between the stimulus and the distracter (Dywan & Murphy, 1996) and have greater difficulties in divided attention tasks and in those that require an inhibition of irrelevant information (Foos & Cherie, 2000). However, the sustained attention of adults is higher because they use more resources than young people (Staub, Doignin-Camus, Bacon & Bonnefond, 2014).

Unconventional advertising produces a visual

impact that is similar in young viewers and older adults, and has a pattern that is determined by the characteristics of the formats (Añaños & Valli, 2012). But what about the rest of the information that appears on the screen? To what extent do adults continue to pay attention and to process the programme when the UA breaks in on it?

Attention is the key mechanism for recognising the advertising stimuli, and this corresponds to the final level of the model proposed by Heath (2009), in which they are identified and processed consciously. Television advertising creates perceptual and conceptual effects with low attention levels (Grimes, 2006), and UA formats affect the preference for the advertised brand positively (Van-Reijmersdal, 2009). But what happens when the programme and the advertising are integrated? What elements do the older adult process?

Ageing involves physical, emotional and cognitive changes (Crespo-Santiago & Fernández-Viadero, 2011). During cognitive ageing patterns of minor damage to the nervous system have been observed, and a decrease of different cognitive domains including, in addition to the changes in divided attention tasks already commented on, a deterioration of the visual and auditory functions and perceptual processes; processing, learning and the retrieval of information, as well as problem-solving and speed of response (Cabrera & Osorno, 2013) are also seen to be impaired.

Cognitive ageing affects the executive functions (Simon, Ruiz & Suengas, 2009; Simon, 2011) that show a slowi down in processing information and difficulties in making decisions (Cabrera & Osorno, 2013). According to these authors, it is possible to speak of a general neuropsychological ageing factor whose main features are: an increased slowness of the perceptual processes which generates difficulties in coding information, a psychomotor slowness in externalising the response and a deterioration in the processing and retrieval of information (Naveh & Kilb, 2014) and in the speed of response (Anstey, Butterworth, Borzycki & Andrews, 2006). This deterioration adversely affects the sensory memory, short-term memory and episodic memory (Montañés & Latorre, 2004). Semantic memories are recovered conceptually up to approximately 80 years, but the semantic access to a word decreases (the phenomenon of having it on the tip of one's tongue), which influences tasks involving verbal fluency (Raz, Lindenberger, Rodriguez, Kennedy & Williamson, 2005; Schneider & Pichona, 2000). The ageing process is also sensitive to blocking states that reduce the processing of information (Buján, 2013). Older adults also have a deficit in the spontaneous organisation of information which, although it improves when aided, is still lower than that of young people (Montañés & Latorre, 2004).

Although there are no studies that show to what extent the older adult processes integrates content, it should be noted that in the transmission of the television message the viewer does not control the speed of emission, which, in adults, increases the difficulty of processing it since the required reaction time increases, and they have greater difficulty in separating the relevant information from the superfluous than young people (Ramos, 2014).

Psychological reactance (PR) is the reaction (of irritation or disgust) that appears as a response to the perception of loss of freedom, and depends on the importance of the behaviour threatened and on age (Brehm, 1989; Brehm & Brehm, 1981). Based on this, the emergence of unconventional advertising in the television programme, thereby restricting viewing, will cause an aversion in the viewer that could trigger adverse behaviour towards the advertiser or the broadcasting channel causing the restriction (Dillard & Shen 2005; Rains & Turner, 2007; Quick & Stephenson, 2008). Our own studies into television with young people show that the degree of irritability towards the UA is high and proportional to the level of

The final conclusion is that integrated content on TV is not effective in older adults since, although it captures their attention, they have serious difficulties in recognising it. This, according to Ramos (2014), is due to the difficulty they have when it comes to processing and separating the relevant information (the programme) from the superfluous (the advertising), although they do not confuse them.

recognition; In addition, the negative behaviour triggered is proportional to the degree of irritability, although the majority of subjects ignore this advertising and continues to view the programme (Añaños, 2011a).

The main objective of this study is to fill a gap in the research into the effectiveness of the integrated content of television in older adults, by studying objectively (eye tracker) to what extent these subjects focus on and process the programme and the advertising when they appear on the screen, compared to young people. The hypotheses are:

• Hypothesis 1. There are no differences in the visual attention paid to integrated content on TV (programme and advertising) between older adults and young people.

• Hypothesis 2. The characteristics of integrated content on TV determine the visual attention paid to the programme and to advertising in both age groups.

• Hypothesis 3. The cognitive recognition of integrated content on TV is lower in older adults than in young people, and differs depending on the advertising format integrated.

• Hypothesis 4. The psychological reactance of older adults to unconventional advertising will be less than that of young people, and as a consequence their behaviour towards the advertiser will also be less negative.

2. Material and method

The stimuli are fragments of television programmes in which the unconventional advertising formats appear. For their selection, the occupancy percentage (in time) of overlays, shared screens and animations in the television programming on two consecutive days and in the afternoon and evening time slots were analysed. The selection criterion was that they belonged to the channel with the greatest amount of UA present, covering the two time slots and have a different level of intrusion in the programme. The stimuli selected were:

• Integration of shared screen (SS): a fragment of the programme «Fama» where, on splitting the screen, the advert for a video game appears (figure 1). Its intrusion level is high.

• Integration of overlay (O): a fragment of the programme «El Hormiguero» where the advert for «El Sandwichera» from «El Pais» appears (figure 2). Its intrusion level is medium.

• Integration of animation (A): a fragment of the programme «Medium» where the self-publicising advert for the TV channel appears (figure 3). Its intrusion level is low.

An «Eye tracker» (model TOBII T60) was used to analyse the visual attention based on the record of the eye movements and travel during the viewing of the stimulus. A digital recorder was also used for spontaneous recognition of the content viewed, a questionnaire on the recognition induced from the stimuli, a questionnaire on the behaviour of the viewer before the appearance of the UA, and the psychological reactance scale based on Edwards et al. (2002), in which the subject evaluated (from 1 to 7) the degree of annoyance caused to them by receiving advertising images while viewing a TV programme (Añaños, 2011a).

60 subjects, 30 older adults (between 68 and 80 years) and 30 young people (between 18 and 25 years) participated in the study. The common criterion for the selection of subjects is that they have a normal or corrected vision (with glasses or contact lenses). The young people (15 men and 15 women) are college students not enrolled in communication courses. The older adults (11 men and 19 women) are subjects who are experiencing normal ageing (not pathological), i.e. without chronic or acute diseases; they are independent, belong to cultural centres for elderly people and are regularly involved in some cognitive activity that keeps them active. The age limit of the adults participating was stipulated as 80 years, an age in which semantic memories are not stabilised and either do not allow for improvement or may worsen

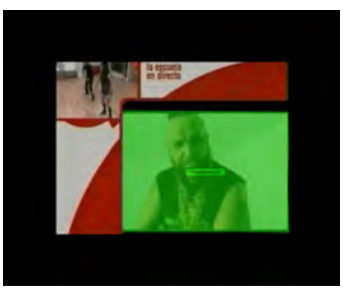

Figure 1. TV fragment where the shared screen (SS) appears.

Figure 2. TV fragment where the overlay (O) appears.

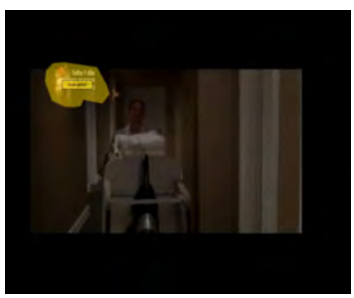

Figure 3. TV fragment where the animation (A) appears.

(Cabrera & Osorno, 2013). All the subjects voluntarily attended the experimental laboratory, signed the informed consent for research participation and received a certificate of collaboration. In the end 53 subjects participated in the study; the dropout rate (11.6%) is due to the impossibility of calibrating the gaze and obtaining eye records (4.6%) and the impossibility of obtaining 90% of these records (7%).

The dependent variables (DV) are the spontaneous recognition of the content viewed (programme or advertising); the recognition induced, in each stimulus, from the programme, the advert, the product and brand advertised; the level of psychological reactance; the behaviour towards the UA and the attention paid to the integrated contents (programme or advertising) of each format studied (O, A and SS). The levels of attention were measured with the «eye tracker» based on the characteristics of the ocular fixations bestowed on the screen:

- Fixation count (FC): number of ocular fixations.
- Fixation length (FL): length (in seconds) of the ocular fixations.
- Time from fixation (TFF): time elapsed from the appearance of the UA until the first ocular fixation (distracter effect).

The independent variables (IV) were the format of integrated content: screen sharing (SS), overlay (O) and animation (A), the age of the participants (older adults and young people) and their gender (male and female).

All subjects underwent the same experimental situation and the same stimulant conditions (SS, O, and A), presented randomly. An exploratory study was performed with a design with blocks (individuals) and random allocation to the treatment sequences (stimuli). The experimental procedure was carried out individually. In the first phase, after the welcome, explanation of the task and collection of the informed consent, the gaze was calibrated with the "eye tracker" in a way that ensured a minimum of 90% of visual records. If the subject was suitable, the stimuli were presented and the visual behaviour recorded. In the second phase, the spontaneous recognition of the content viewed was recorded, and then the subject answered the questionnaire on the recognition induced, the psychological reactance scale and the questionnaire on behaviour towards the UA.

3. Analysis and results

The qualitative analysis of the «Heat Maps» shows that, during the shared screen (Figure 4), the eye fixations are concentrated (heat areas) on advertising and, less intensely, on the programme. In overlay (Figure 5) there are two heat zones, that of the 'banner', at the bottom, and that of the programme. During the animation (Figure 6) the hottest area is the face of the programme's protagonist, and there is a less intense zone in the advertising area.

In order to analyse the visual behaviour quantitatively in each stimulus, the areas of interest (AOI) corresponding to areas of the screen that captured most eye fixations during the time interval in which the integrated content appeared were generated: AOI-Programme and AOI-Advertising.

A quantitative analysis was performed with the program IBM SPSS «Statistics», Version 20. The analyses show no statistically significant differences between the genders of older adults, and therefore the results were analysed without considering this variable.

On the shared screen (SS) (Table 1), the adults (Kruskal WallisTest) directed more eye fixations (FC) towards the programme than the young people (p=.00421), and although there were no significant differences between the two groups in terms of the FC directed towards the advertising (p=.0900), the length of fixations (FL) was lower in the adults (p=.0221). In both groups, the FC directed towards advertising are greater than those directed towards the programme. In the overlay (O) and (A) animation, the fixations directed towards the programme and towards the adverti-

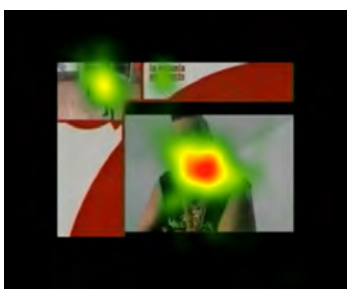

Figure 4. "Heat Map" of the Shared Screen (SS) stimulus.

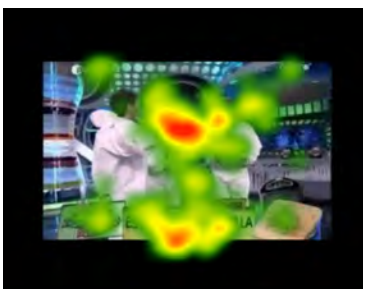

Figure 5. "Heat Map" of the Overlay (O) stimulus.

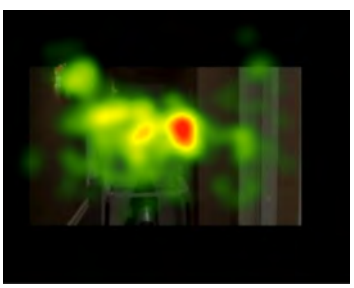

Figure 6. "Heat Map" of the Animation (A) stimulus.

Tabla 1. Kruskal Wallis Test: medias de las fijaciones oculares (FC) y su duración (FL) de cada grupo en cada AOI y en cada formato

	Contenido Integrado en T V					
	AOI-Programa			AOI-Publicidad		
	Media FC		P-Value	Media FC		P-Value
	Adulto	Joven		Adulto	Joven	
PC	14,78	9,93	*.0421	40,27	35,03	.0900
S	4,68	5,18	.4745	11,76	9,29	.2050
A	2,73	2,63	.9189	2,58	3,59	.2423
	Media FL (segundos)		P-Value	Media FL (segundos)		P-Value
PC	0,54	0,63	.2088	0,53	0,58	*.0221
S	0,69	0,68	.4602	0,30	0,29	.5967
A	0,51	0,61	.5664	0,57	0,50	.8790

sing (FC) and their length (FL), do not differ between the two groups.

The joint analysis (Kruskal Wallis Test) of the fixations (FC) and their length (FL) directed towards the programme and towards the advertising showed that (Table 2), during the overlaying, the FC directed towards the advertising were greater than those towards the programme (p=.000) although their length was lower (p=.000). During the animation, there were no significant differences between the fixations directed towards the programme and towards the advertising (p=.491) or in their length (p=.396).

The analysis of the attention capture of the UA was performed (Kruskal Wallis Test) from the «Times First Fixation» (TFF). The results (Table 3) do not show significant differences between the two groups. However, the TFF depends on the degree of intrusiveness of integrated advertising format: being nil in the shared screen (SS), higher in the overlay (O) and much higher in the animation (A).

Spontaneous recognition of the integrated content is significantly different (Chi-Square Test) in both groups (p<.0001): the adults recognise the programme more than young people and the advertising and the joint appearance of the programme and the advertising less (no adult does so and 40% of young people do). 61% of adults do not recognise anything compared to 4% of young people.

The analysis of the recognition induced (Table 4) shows that (Fisher's Exact Test) in the shared screen (SS) the recognition induced from the programme (p=.0005) and from the advertising (p=.0001) for the adults is much less than that for the young people. In the overlay (O) the adults recognise less the programme (p=.0024), the advertising (p=.0041) and the product (p=.0160), while both groups did not differ in the recognition of the trade mark (p=.0982), nor confuse the programme with the advertising (p=.0892). In the animation (A) the recognition induced for the adults does not differ significantly from that of the young people, being very low or almost nil.

The psychological reactance of the adults is significantly less (Chi-square Test) than that of the young people (p=.0463): Unconventional advertising annoys 61% of adults and 92% of young people. The behaviour of adults towards the UA does not differ from that of young people (Chi-Square Test): almost half of the subjects ignored the UA, a quarter say they look at them and 85% of the adults do not change channel. Unconventional advertising does not provoke a negative image of the advertiser or of the TV channel.

4. Discussion and conclusions

The advertising integrated into TV programmes captures the attention of adults (as it does of young people) in the sense specified by Lachter and others (2004) and Pieters and Wedel (2007), regardless of the evolutionary status, as Kosnik and others (1986) and Kemper and others (2004) pointed out, which may also be due to the fact that, since they are moving stimuli, they have a very high level of attention (Smith & Mital, 2013). The level of intrusion of the integrated format determines the extent to which older adults are paying attention to the programme when the unconventional advertising appears, as pointed out by Isaakowitz and others (2006). During screen sharing adults pay more attention to the programme than young people, while in other formats the visual atten-

Table 2. Kruskal Wallis Test: average FC and FL directed in each AOI in each format (in all the subjects)

		AOI-Programme	AOI-Advertising	P-Value
FC Average	Overlay (O)	4.93	10.52	**.000
	Animation (A)	2.68	3.08	.491
FL Average	Overlay (O)	0.68	0.29	**.000
	Animation (A)	0.56	0.53	.396

Table 3: Averages for the TFF (seconds) for each format in each group			
	Average TFF (seconds)		
	Young person	P-Value	Kruskal Wallis Test
SS	0.00	0.00	.1786
O	0.21	0.22	.8876
A	4.78	3.19	.3003

tion of the adult does not differ from that of the young person: during overlaying, the advertising completely captures the attention at the expense of the programme, while during animation, attention is paid equally to the programme and to the advertising. Hypotheses 1 and 2 are partially met.

Older adults have a spontaneous recognition of integrated content that is far below that of young people (Kemper & al., 2006; Buján, 2013). In addition, 60% of adults demonstrate a blocking situation (compared to 4% of young people) when having to recognise the information they have just seen, as pointed out by Schneider and Pichona (2000), Raz and others (2005) and Anstey and others (2006). The induced recognition of adults is also lower (almost nil) when the unconventional advertising format has a high or medium level of disruption, which may be due, according to Ramos (2014), to the difficulty of having to separate important information (the programme) from the superfluous information (the advertising) and to the slowing down of information processing, according to Cabrera and Osorno (2013). Hypothesis 3 is fulfilled in terms of the advertising content which has a high or medium level of intrusion.

These results agree with the proposal put forward by Healt (2009), since attention is paid to unconventional advertising is to at a pre-attention or unconscious level, although it is not always identified and recognised, and it is in the process of recognition where adults are less capable.

Older adults have a high psychological reactance but lower than that of young people, which may be due to the fact that they process less advertising information (Añaños, 2011a). However, their behaviour towards programming does not differ from that of young people: they ignore the advertising, continue watching the programme and do not show negative attitudes toward the channel or the advertised brand. These results do not support those obtained by Ruz and Lupiáñez (2010) and Pacheco and others (2009), since the elements captured attentionally have no effect on the subsequent conduct of the subject, and support those found by Añaños (2011a) with young people. Hypothesis 4 is only fulfilled on the levels of psychological reactance.

The final conclusion is that integrated content on TV is not effective in older adults since, although it captures their attention, they have serious difficulties in recognising it. This, according to Ramos (2014), is due to the difficulty they have when it comes to processing and separating the relevant information (the programme) from the superfluous (the advertising), although they do not confuse them.

The limitations of this study lie in the fact that only three formats of integrated content have been studied, and the fact that the level of the subjects' cognitive development has not been measured psychologically, since the multidisciplinary development of the subject

Table 4. Ficher's Exact Test: percentage of subjects that recognise each element inducidly			
Recognition induced	TV INTEGRATED ADVERTISING CONTENT		
	Shared Screen (SS)		
	Percentage		P-Ficher's Exact Test
	Adult	Young person	
Programme	7.68	67.66	**.0005
Advertising	0.00	72.01	**.0001
Product	0.00	23.82	.0753
Brand	0.00	0.00	-
Programme-advert confusion	7.66	4.02	.8981
	Overlay (O)		
Programme	22.96	80.02	**.0024
Advertising	15.02	67.62	**.0041
Product	0.00	36.21	**.0160
Brand	7.66	12.32	.0982
Programme-advert confusion	1.02	3.72	.0892
	Animation (A)		
Programme	0.00	23.32	.0685
Advertising	0.00	3.96	1
Brand	0.00	0.00	-
Product	0.00	0.00	-
Programme-advert confusion	6.82	0.00	.3562

proposed by Pérez-Pérez and Navarro (2013) has been considered. The conclusions and limitations themselves suggest further research that would evaluate new formats of integrated content and consider the evaluation of the subjects' cognitive development, especially that of the elderly. However, the results obtained are sufficiently significant to consider the adaptation of integrated content on TV to older adults; Thus, if the aim is for them not only to pay attention (which they already do), but also to process the information, its size should be increased, especially that of the unconventional advertising, as should the exposure time; In addition, the integrated content should contain as few elements as possible.

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Design Patterns to Enhance Accessibility and Use of Social Applications for Older Adults

Patrones de diseño para mejorar la accesibilidad y uso de aplicaciones sociales para adultos mayores

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ABSTRACT

The aim of this paper is to present a non-exhaustive set of 36 design patterns for interactive social applications used by older adults. This proposal represents a reliable starting point for designers/developers to easily incorporate usability in interfaces for said technology promoting technology acceptance, use and adoption among older adults. The proposed patterns were based on previous efforts commonly presented as a design criteria and guidelines to describe usability issues in this kind of interfaces, reinforcing those alternatives by specifying related usability issues and providing solutions in a pattern-fashion useful for designers/developers. Pertinence of the patterns was analyzed through a usability study implementing «heuristic evaluation» technique (frequently used in Human-Computer Interaction to obtain users' perception on a particular design). The study was conducted from two perspectives: the vantage point from experts, and the perception of a social group of older adults. The analysis revealed the proposed patterns are conducive to create well-designed interfaces able to provide a better user experience, encouraging a positive impact in the quality of life in older adults.

RESUMEN

El objetivo de este artículo fue proponer una colección no exhaustiva de 36 patrones para el diseño de interacciones en aplicaciones sociales para adultos mayores. La propuesta representa un punto de partida confiable para facilitar, a diseñadores/desarrolladores, la integración de usabilidad en las interfaces de estas tecnologías con el fin de fomentar su aceptación, uso y adopción entre los adultos mayores. Esta propuesta se basa en esfuerzos previos comúnmente expresados como criterios y guías de diseño para definir los posibles problemas de usabilidad en este tipo de interfaces, y se concentra en reforzar estos enfoques mediante la integración de una mayor descripción de tales anomalías y alternativas de solución bajo una estructura de patrones útil para los diseñadores/desarrolladores. Se realizó un estudio de usabilidad con la técnica «evaluación heurística» (comúnmente utilizada en interacción hombre-máquina para obtener la percepción de los usuarios sobre un diseño particular). El trabajo se llevó a cabo desde dos perspectivas: el punto de vista de expertos técnicos y la percepción de un grupo social de adultos mayores. Los resultados reflejaron que los patrones propuestos propician la creación de interfaces bien diseñadas capaces de ofrecer una mejor experiencia de uso y promueven un impacto positivo en la calidad de vida de los adultos mayores.

KEYWORDS | PALABRAS CLAVE

Accessibility, usability, elder, digital divide, digital inclusion, social interaction, social networks, interaction patterns.
Accesibilidad, usabilidad, adultos, brecha digital, inclusión digital, interacción social, redes sociales, patrones de interacción.

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1. Introduction

Social applications such as «Facebook», «Twitter», «Pinterest», or «Google+» allow easy communication, collaboration and social interaction among users and their friends and family and/or with third parties by establishing new relationships (Gomes & al., 2014). These technological tools fortify traditional communication channels by breaking down time and distance barriers. However, these tools have also created an increasing generational digital divide between young people and older adults, revealing different age groups based on their abilities to communicate through Information Technology (IT) tools (Muñoz & al., 2013). In this context, older adults are forced to interact with IT and face multiple obstacles derived from bad designs and aggravated by natural age-changes. In fact, older adults perceive web sites at least 43% more difficult to use than young people (Abad, 2014; Nielsen, 2013; Páez & al., 2011; Zaphiris, Kurniawan & Ghiawadwala, 2007). These barriers or obstacles represent a big challenge, but they also represent opportunities to respond questions such as –how could older adults take advantage from IT to improve their personal and/or social situation?– could these obstacles help identify specific needs, tasks and strategies to ensure user-friendly designs (Abad, 2014; Braun, 2013; Gomes & al., 2014; Patsoule & Koutsabasis, 2012). Easy-to-use designs for social applications are significantly important since these technologies can improve the quality of life of older adults by offering a better communication alternative with their loved ones, and thus reducing their loneliness and isolation (Agudo, Pacual & Fombona, 2012; Lian & Yen, 2014).

In fact, previous studies by the United Nations, such as «The World Population Aging» estimate that in 2050 more than 2 billion older adults will be using Internet, which represents a 300% (UN, 2013).

Inherently, more and more older adults will require social applications that would allow them to better communicate and become active, independent participants in a digital-society. This premise highlights the need to improve the current social applications' design (Agudo, Pacual & Fombona, 2012; Patsoule & Koutsabasis, 2012). The scientific community is also interested in providing older adults with multiple alternatives to increase the acceptance, use and adoption of technologies such as TAM «Technology Acceptance Model» (Davis, 1989; 1993), STAM «Senior Technology Acceptance Model» (Renaud & Van-Biljon, 2008), TRA «Theory of Reasoned Action», TPB «Theory of Planned Behavior» (Lian & Yen, 2014) y UTAUT «Unified Theory of Acceptance and Use of Technology» (Venkatesh & al., 2003). Other research studies analyze the utility, usability, social influence, and the accessibility of social networks in different scenarios and application domains (Lehtinen, Näsänen & Sarva, 2009; Yang & al., 2010).

The findings represent a base for technical approaches in terms of their principles, criteria and requirements to design adequate social applications for older adults (Gomes & al., 2014; Hope, Schwaba & Piper, 2014; Moreno & Martínez, 2012; Moser & al., 2011). Detailed proposals are available on the web as design guides (Agelight, 2001; Kurniawan & Zaphiris, 2005; Zaphiris, Kurniawan & Ghiawadwala, 2007), and redesign guides for older adults (Patsoule & Koutsabasis, 2012), which integrate Universal Design Principles (Connell & al., 1997), User Centered Design, usability and web-design accessibility (Pernice & Nielsen, 2014), and guides for web-content accessibility such as W3C-WCAG 2.0 (Affonso & al., 2010; W3C, 2008). Several mobile tools have recently emerged to help older adults improve and increase their social relations (Muñoz & al., 2013).

The government, industry and society have been financing strategies in favor of older people by using Information Technology (IT) and social applications in fields like health, digital-literacy, web-services accessibility, among others (Garcia-Vazquez, Rodríguez & Andrade, 2009; Páez & al., 2011). However, most of the existing alternatives are not well specified making it difficult for designers/developers to understand and implement user-friendly designs. This, in turn, creates interfaces that are non-suitable for older adults (Arfaa & Wang, 2014; Gomes & al., 2014; Nesbitt, 2005). These issues could be overcome by providing better specified alternatives to reinforce interactions among users and available web-resources (Affonso & al., 2010). Design patterns represent a good strategy. Alexander cited by (van-Welie, van-der-Veer & Eliëns, 2000: 4) defines a pattern as «a three-part rule, which expresses a relation between a certain context, a problem, and a solution», «each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over…». A pattern focuses on the context and can explain developers how, when, and why the solution could be applied (Van-Welie, Van-der-Veer & Eliëns, 2000:1).

This paper proposes 36 patterns to design interface interactions for social applications that are adequate for older adults and that integrate acceptance, usage and adoption factors, following an inclusive-user centered design strategy.

2. Research method

This study started with an extensive literature review of over 100+ related papers. A total of 6 proposals directly related with the objective of this research were selected by considering the advantages, disadvantages and general characteristics of each proposal. Selected proposal were classified into two categories:

a) Social interaction. Group studies that define accessibility barriers, use and adoption of ICTs, web interfaces, and social applications for older adults, this category include the following proposals.

– Study 1 (S1). «A Usability Study on Elder Adults Utilizing Social Networks Sites» (Arfaa & Wang, 2014). In this study were identified several usability, accessibility, design understanding, and navigability problems through a system prototype based on «Facebook».

– Study 2 (S2). «Age and Web Access: The Next Generation» (Hanson, 2009). State of the art work on the impact of aging people in the use of ICTs; provides recommendations to reduce various cognitive, perceptual and motors barriers associated with aging and the use of technology.

– Study 3 (S3). «Designing a Facebook Interface for Senior Users» (Gomes & al., 2014). This presents recommendations for interfaces design for older adults after direct observation studies, focus group interviews with older adults after the use of a prototype of mobile social application.

Table 1. Fundamental design criteria for social applications used by older adults

CRITERIA	S1	S2	S3	S4	S5	S6
The interface design must be simple (limited number of options), consistent and predictable regarding how to perform the actions.	□	□	□	□	□	□
Language and textual content must be simple, clear, concise and easily legible.	□	□	□	□		□
Information must be concentrated and mainly clustered in the center of the interface.	□	□		□	□	□
Provide appropriate space between the interface elements (text lines, images, links, among others).	□	□		□	□	□
Highlight specific information and important interface elements, such as: menus, links, and buttons, among others.	□			□	□	□
Avoid scrollbars if possible.	□	□		□	□	
Colors, textures, graphics and used contrasts in the user interface must be appropriate and not create distraction.	□	□		□		□
Appropriate feedback, clear and accurate to any change that occurs in user interface and navigation.				□	□	□
Provide objects, graphics and large links.	□	□		□		
Provide instructions and signals to improve navigation.	□	□		□		
The drop-down menus in the interface must be displayed slowly (to provide enough time) to read information or be activated for users with low cognitive and motors skills.		□		□	□	
Navigation must be simple, clear and consistent.	□			□		□
Icons must be simple, meaningful, and intuitive (associated with real world objects).	□			□	□	
Interactive elements must be perceived and understood without documentation.	□					□
Images and icons must be part of the selectable area (clickable) in links.	□				□	
The size of all web page elements must be adjustable (resizable) according to user's needs.		□				□
It must be possible to return to the homepage from all subpages in the application			□		□	
Provide online assistance (tutorial)	□			□		
Privacy (content publication)			□			
Avoid double clicks on the interface.				□		
Content and group-based functionality (friends and family).			□			
Give more relevance to photos and images than other content.			□			
Design must inspire trust.						□
Interactions must be focused on the family.			□			
Differentiate between interactive elements and those which are not.					□	
The general design must be intuitive and aesthetic.	□					
Avoid irrelevant information on the interface.				□		
Graphics must be relevant to the displayed information and must not used for decoration purposes only, do not use animated graphics.				□		
Add an appendix.	□					
Consistent interface (do not update often).			□			
Error messages must be simple and easy to understand.				□		

b) Design guidelines. This gathers studies with principles, criteria and guidelines for the design and redesign of web interfaces for older adults, which includes the following:

– Study 4 (S4). «A Systematic Approach to the Development of Research-Based Web Design Guidelines for Older People» (Zaphiris & al., 2007). It presents 38 guides for design and evaluation of websites for the friendly aging.

– Study 5 (S5). «Improving WCAG for Elderly Web Accessibility» (Affonso & al., 2010). This proposes 30 criteria for web accessibility for older adults as reinforcing of standard WCAG 2.0 (W3C, 2008).

-Study 6 (S6). «Redesigning Web Sites for Older Adults: A Case Study» (Patsoule & Koutsabasis, 2012). This describes 7 principles and 45 web design guidelines for older adults derived from the redesign of a traditional website through user-centered approach.

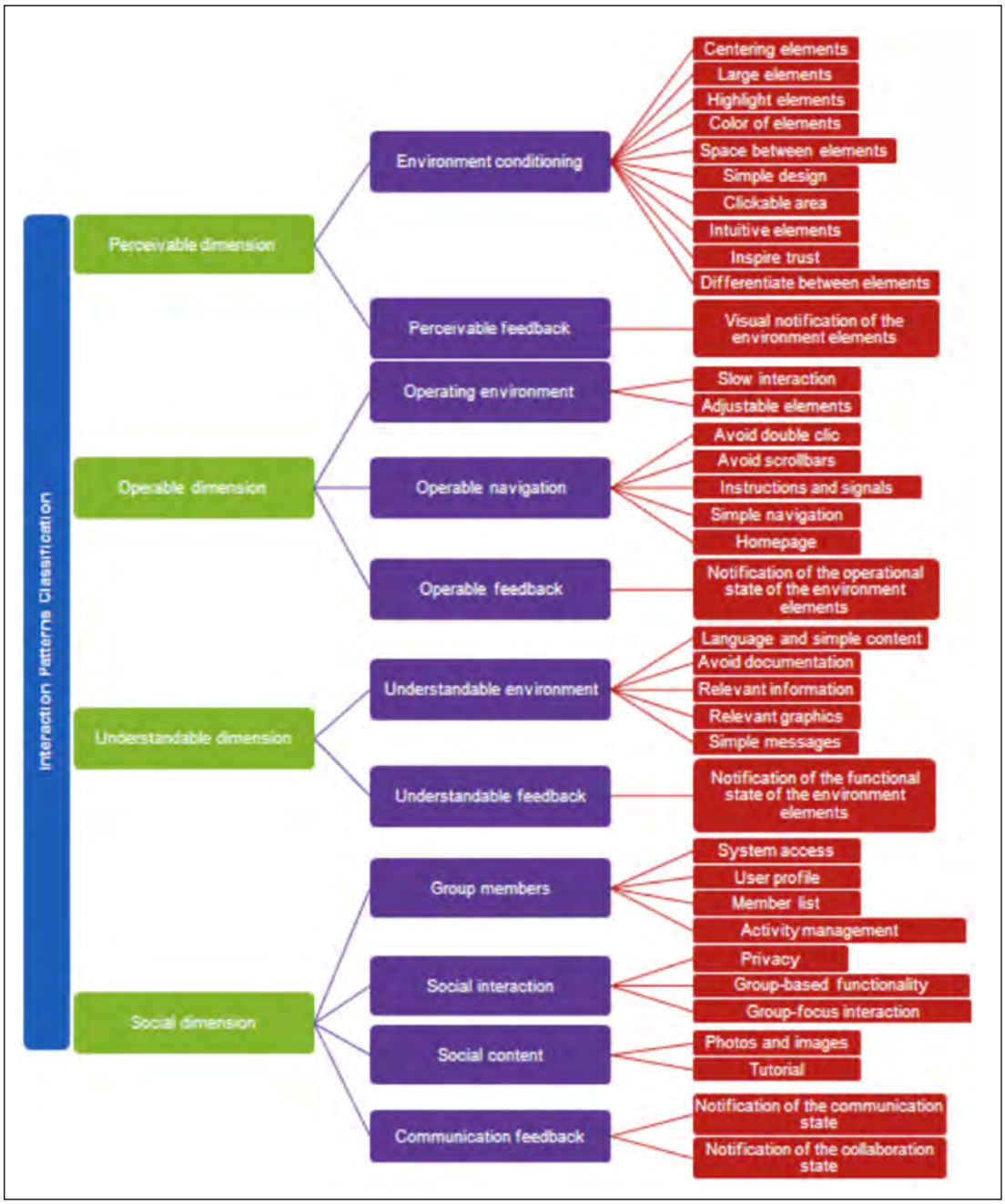

Figure 1. Interaction pattern classification.

From the previous 6 papers, barriers to the acceptance, use and adoption of TIC were identified (including social applications) for older adults, which were associated with the general accessibility criteria for people with physiological constrains (W3C, 2008). We selected 31 «fundamental design criteria for social applications used by older adults» (table 1; see last page).

The criteria presented in table 1 are the basis for identifying patterns, deriving a non-exhaustive collection of 36 patterns to design appropriate interactions for social applications for older adults. The process concludes with an evaluation of these patterns through an empirical study. The following sections describe the proposed classification, participant evaluations, and outcomes.

3. Proposal description

The classification of design patterns focuses on the integration of the design criteria presented in table 1, as well as usability principles, human computer-interaction (HCI), user-centered design; and communication and social interaction aspects. To order the integration of these aspects, the classification incorporates 4 dimensions with 11 design principles each, which in turn focuses on 36 specific patterns, see figure 1. The dimensions, principles and patterns of the proposed classification are described in the next subsections.

• Perceivable dimension: According to (W3C, 2008), «Information and user interface components must be presentable to users in ways they can perceive», this means, must be sorted properly and offer some form of feedback e.g. proper visual and auditory services for users. This dimension includes patterns related to: general arrangement of the interface elements; and perceivable feedback from environmental elements.

• Operable dimension: The (W3C, 2008) indicates that «user interface components and navigation must be operable for the user», that is, the user can do the tasks properly. This dimension includes criteria related to: suitable operation of the environment elements, simple, clear and consistent navigation; and operable feedback.

– Understandable dimension: In the same way (W3C, 2008) indicates that «information and the operation of user interface must be understandable», that is, interface elements must be accessible and easy to use. To achieve this, specific criteria and patterns must be included and related to: interface content and information; and understandable feedback of the environment elements.

– Social dimension: This dimension focuses on criteria and patterns related to: contact management; interaction with other people across the application; related content with social group and visualization of the activities to be performed by the social group.

3.1. Structure and definition of the interaction patterns proposed

The essence of the pattern concept is to «express knowledge in an orderly, accurate and complete manner » (Rodríguez, 2005). To keep this vision, the structure of the proposed patterns is based on the recommendations of (Van-Welie, Van-der-Veer & Eliëns, 2000:7) under the following headings: name, problem, usability principle; context; solution; example; and related patterns. In order to clarify the formal structure, the following section describes a fragment of the classification, including the pattern «Centering elements» of «Perceivable dimension», and the pattern «Group-based functionality» of «Social dimension». It is important to mention that the complete description of the classification (36 patterns) is available at (http://goo.gl/KGsWjj).

a) Pattern 1. Perceivable dimension: Environment conditioning.

– Name: Centering elements.

– Problem: What can be done for the information displayed in the interface to be presented properly and within an appropriate visual field to older adults?

– Usability principle: Consistency and standards.

– Context: The location and content quantity in a user interface is important for older adults; they prefer pooled information with few options as it prevents a cognitive barrier. According to Affonso and & (2010), adults focus their attention on the center of the screen and disregard the information provided in the lateral header and footer areas.

– Solution: The user interface of social application for older adults must contain the essential elements needed and grouped in center of the screen; this will allow the older adult to visualize in a better way the area of interaction in the interface.

– Example: Figure 2a shows an example of web interface with information located in the center of the screen and figure 2b shows a mobile device interface with the interaction elements located in the central part of the screen.

– Related patterns: Simple design, simple navigation.

a) Pattern 2. Social dimension - Social interaction

– Name: Group-based functionality.

– Problem: The functionality of current social net-

working services has a wide range of integrated services to interact between users, which represent an accessibility and use barrier for older adults.

– Usability principle: Mental models and metaphors.

– Context: Family is an essential factor for the older adults since it creates the communication and social interaction base group; social network services must provide the necessary tools for effective communication within this social group.

– Solution: The interaction elements of the interface must focus on the activities and tasks related to the circle of social interaction of older adult.

– Example: Figure 2c shows a desktop interface application with group-based functionality and figure 2d shows a mobile device interface, where the application elements target the communication and interaction needs of older adults.

– Related patterns: Privacy, group-focus interaction

4. Test environment: Heuristic evaluation

Heuristic Evaluation (HE) is an inspection method commonly used in usability engineering to find usability problems in hardware and/or software user interfaces. HE could be performed by a small group (2-5 evaluators), and analyzes the level of accomplishment of specific usability/good-design principles which are called «Heuristics» (Nielsen, 1993). This proposal was analyzed through a specific scenario using HE and considering the following case study:

a) Description: This proposal was evaluated from two perspectives «technical aspects» and «user experience» in order to obtain a representative starting point for developers to design social applications that provide a good user-experience for older adults. «Facebook for Older Adults, EF Social v.1.0» was selected as the mobile social application due to its popularity (Over 10,000 downloads reported), which is available at: (http://goo.gl/ZkwKjR).

b) Participants: A total of 70 individuals participated in the study, including 5 Research Professors or technical experts, internationally recognized for IHC and user experience (UX) (1 female and 4 males); 65 elders (54 mexican women and 11 men between the ages of 60 and 98), who are members of the «Golden Age» social group in the rural community Tlachichila, Nochistlán de Mejía (Zacatecas, México). This group was established in 2000 by the «Golden Age» members themselves with the purpose of promoting social integration and recreational activities, taking courses and workshops in diverse topics (including basic digital literacy), among other activities.

c) Methodology: Technical experts were provided with an overview of the study purpose and they were given a set of proposed patterns expressed in Heuristic fashion. The experts then individually evaluated the mobile social application «Facebook for Older Adults, EF Social v.1.0». The obtained feedback helped determinate the technical pertinence of the proposed technique. Subsequently 5 tasks and 9 sub-tasks were defined for the elders to complete. The results helped determine the level of experience of each user. The following list shows the set of tasks users were asked to perform.

1) Start the application: Click on the application icon to start (EF Social).

2) Identify the active elements of the User Interface (Interpreting Home page): Click on the option «Pictures»; Click on any photograph album.

Figure 2. Examples of user interfaces, courtesy of: a) CDC, 2014; b) Kwido, 2014; c) Telikin, 2014; y d) EFA, 2013.

3) Add a contact to the contact-list «Family»: Click on the option «Contacts»; Identify the «Assign group» button; Select the group «Family».

4) Write a comment to any family contact: Select a contact; Write a message.

5) Exit the application: Find the «Exit» button.

Table 2. Identified problems by technical experts

PROBLEM	PATTERN/SOLUTION
1. The text «Please wait while loading...» is static, that is, the interface does not provide feedback that shows an activity in progress; and creates uncertainty to the user. This issue is aggravated by the length of time it may take to load the homepage.	Notification of the operational state of the environment elements.
2. The lighted color in the tabs does not allow to identify which of them is the entry/attention focus.	Color of elements. Intuitive elements. Differentiate between elements.
3. Using the text below each photo album creates two clickable areas for the same item.	Clickable area.
4. In most application interfaces, the data input box «Post something on the wall of my friend» uses a smaller «font» size than the rest of the App.	Large elements.
5. The button «publish» does not provide visual or auditory feedback when it is pressed, this happens with most buttons in different sections.	Visual notification of the environment elements.
6. The popup window to add a contact to a predetermined list, e.g. «Friends/Family», does not allow setbacks or cancellation action, forcing to select one of two options in the popup window to continue.	Simple navigation. Instructions and signal.
7. To exit the application the user must find the button «exit», which is located inside the tab «profile», leading to a higher cost of interaction for the user.	Simple design. Simple navigation.

5. Results

The 5 technical experts analyzed «Facebook for Older Adults, EF Social v.1.0» by looking for potential interaction/usability issues and used the proposed 36-set of patterns/heuristics. They found several design flaws specifically related to the way that older adults could perceive the applications' interface. For example, inconsistencies with colors and shapes, as well as a lack of feedback were observed (section 3.1). In addition, experts observed some operability problems like the absence and/or limited accessibility of returning-option, cancel-option, and important options (like exit-option) (section 3.2). On the other hand, the application's feedback, on most of the interface elements, is limited and difficult to understand (section 3.3). Finally, expert participants found inconsistencies related to interaction-presentation, such as the double zone «clickable» to select a contact (section 3.4). Table 3 shows a fragment from the experts' perceptions including a brief description of the detected problem and the description of related pattern(s) that need to be solved.

As shown in table 1, most tasks were not successfully completed and the current design of the App «EF Social» does not provide an adequate experience of use. Participants corroborated this finding during the final comment session.

«It was difficult for me to know what was happening when the application started, nothing moved, everything was blue; and it was difficult to read the white text », Mrs. Chávez, 75 year old (figure 3a).

«The color used in the tabs confused me because they were three colors: white, blue and gray; when I was able to access the photos I did not know if I should choose the image or text to enter to an album» Mr. Esparza, 67 year old (figure 3b).

«I wanted to add my nephew to my contacts but I could not read the text and the buttons were very small», Mrs. Pasillas, 81 years old (figure 3c).

«The text in the box was gray and I could not see it. I did not know if the message was sent», Mrs. Olmos 60 years old (figure 3c).

«I did not find the exit button» Mrs. Juárez 74 years old (figure 3d).

6. Conclusions

This study reveals several design anomalies and controversies from the interaction offered by the application «Facebook for Older Adults, EF Social v.1.0» (http://goo.gl/ZkwKjR). Issues like design inconsistencies, small font sizes, low-fluent navigability, and low levels of control, were common barriers that participants face when interacting with EF Social. This situation prevented participants to adequately completing the assigned tasks (table 3).

It is important to mention that older adults' perception agrees with the experts' point of view (table 2). Table 3 shows that task 5 «Exit the application» had the biggest discrepancy between those participants who did not complete the task and those who did, 15% V.S. 85%, respectively. Additionally, experts

Table 3. Task list completed by older adults		
TASKS	%OF PARTICIPANTS WHO COMPLETED TASKS	
	YES	NO
1. Start the application.	72%	28%
2. Identify the active elements of the User Interface (Interpreting Home Page).	55%	45%
3. Add a contact to the contact-list «Family».	35%	65%
4. Write a comment to any family contact.	40%	60%
5. Exit the application.	15%	85%
*For a task to be considered «complete» all associated subtasks had to be completed.		

pointed out that users needed to literally «guess» the location of the «Exit» bottom, which is hidden in the last option tab and, according to them, it should be visible at all times.

Undoubtedly, the identified issues reduce and/or prevent older adults' accessibility, use and adoption of this technology. Consequently, it is necessary to develop the necessary tools to close this technology-usability gap. As mentioned before, there are several available approaches to reduce this generational gap; however, they are barely applied by developers due to their poor specification that does not facilitates their implementation/development.

In this context, the proposed patterns could provide a basic but reliable starting-point for developers to create well-designed social applications for older adults that promote a better quality of life by facilitating interface communication with their loved ones.

Implementing the proposed patterns would improve the design of the interaction offered by social applications for older adults. Well-designed interaction could assist older adults in doing the things they care about, such as easily communicating with their loved ones, increasing their digital-society acceptance and integration by utilizing these technologies, and becoming independent from people to use information technology. Furthermore, the proposed strategy could also be implemented in a heuristic fashion not only to identify usability issues in current applications, but also to design/create new social applications. In addition, the study suggests that the proposed patterns could be suitable for other age-groups provided that potential adjustments to specific scenarios are considered. Existing literature on alternative patterns has not explore these aspects. As such, this study contributes to academia by presenting a starting point to continue to develop the proposed patterns and subsequently improve technology usability among older adults.

Even though the results are promising, this research project is not intended to propose an alternative that accounts for all interaction preferences from older adults. It is important that future research understands and takes into account the heterogeneity of this age group that has multiple contextual-factors such as economic status, access to technology in their communities, among other aspects.

Several venues for future research have been unveiled, such as the materialization of the patterns through a digital mockup to be evaluated by means of the diary-study technique where would participate other older adults groups. New data could help to corroborate findings from current study

Figure 3 a), b), c), d). User interfaces of EF Social Application (EFA).

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Using Technology to Connect Generations: Some Considerations of Form and Function

Usando la tecnología para conectar las generaciones: consideraciones sobre forma y función

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ABSTRACT

Nowadays, as ageing increases in Western societies it has become more evident that multiple generations are ageing concurrently at any given time in history. Therefore, ageing must be approached as a multi-generational phenomenon, not just as a question of elders. In this context, situations that engender increased interactions between generations are garnering more attention. There is a growing emphasis on expanding the role of technology in intergenerational programmes, within the field of intergenerational studies. Consequently, this paper is focused on education and learning processes within intergenerational programmes with a strong technology component. Information from a total of 46 intergenerational programmes from 11 countries has been gathered through a survey. Level of impact, status of generational groups, and centrality of technology have been appraised for all programmes in the sample. Technology learning-teaching constitute the main area of intended impact of these programmes. However, the surveyed programmes employ as well a wide range of strategies to facilitate intergenerational communication, cooperation and relationship formation between generations involved. Interest of programmes examined does not just consist of teaching the use technology but of experimenting with technology in different forms and functions and exploring the positive potential for enhancing intergenerational relationships.

RESUMEN

Actualmente, conforme el envejecimiento en las sociedades occidentales aumenta, resulta más evidente que en cualquier momento histórico dado hay varias generaciones envejeciendo simultáneamente. Por tanto, el envejecimiento debe ser estudiado como fenómeno multi-generacional y no solo como un asunto de personas mayores. En este contexto, están suscitando más atención las situaciones que implican más interacciones intergeneracionales. Dentro del campo intergeneracional está aumentando el interés en torno a las posibilidades de expandir el papel de la tecnología en los programas intergeneracionales. En consecuencia, este artículo se centra en los procesos de educación y aprendizaje acaecidos dentro de programas intergeneracionales con un fuerte componente tecnológico. Mediante un sondeo se recogió información sobre un total de 46 de este tipo de programas de 11 países. Todos se han evaluado en la muestra según su nivel de impacto, el estatus de los grupos generacionales y la centralidad de la tecnología. La enseñanza-aprendizaje de la tecnología constituye la principal área de impacto buscada por estos programas, que, no obstante, también utilizan una amplia variedad de estrategias para facilitar la comunicación, la cooperación y la formación de relaciones intergeneracionales entre las generaciones implicadas. El interés de los programas analizados no solo consiste en enseñar a utilizar la tecnología sino en experimentar diferentes formas y funciones con ella, así como en explorar el potencial positivo de la tecnología para mejorar las relaciones intergeneracionales.

KEYWORDS | PALABRAS CLAVE

Ageing, technology, teaching-learning, older adults, youth, intergenerational programmes, intergenerational relationships, communication. Envejecimiento, tecnología, enseñanza-aprendizaje, personas mayores, jóvenes, programas intergeneracionales, relaciones intergeneracionales, comunicación.

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1. Introduction

Talking about ageing is not just talking about older people. From a life-span perspective, we all age while we live and from a life-course perspective, our ageing process always happens within the context of diverse age cohorts. Whatever the perspective, it has become evident that multiple individuals and generations are ageing concurrently at any given time in history. Hence, ageing must be approached as a multi-generational phenomenon, not just as a question of older populations. Furthermore, the fact that multiple generations are ageing makes us think of inter-generational interactions as another potential component in the analysis of human ageing processes. From an intergenerational perspective, we not only age but somehow we are ageing together.

Demographic studies conclude that apart from lower fertility and longer life expectancy, modern societies are witnessing «an increase in the number of living generations, and a decrease in the number of living relatives within these generations» (Harper, 2013: 2). In this context, situations that engender increased interactions between successive generations tend to draw positive attention, whether generations are considered in terms of age (e.g. older and younger people), family links (e.g. grandparents and grandchildren), community life (e.g. youth and elders) or organizational membership (e.g. seniors and juniors).

The focus of this paper is linked to the set of planned and intended intergenerational initiatives under the name of intergenerational programmes, and our specific emphasis will be put on education and learning processes within intergenerational programmes with a strong technological component. Typically, the term intergenerational programme refers to activities or programmes that increase cooperation, interaction or exchange between any two generations (Kaplan & Sánchez, 2014).

Within the intergenerational studies field, there is a current emphasis on expanding the role of technology in programmes and practices that intentionally connect generations. European Union (EU)-funded multi-country initiatives that employ technological advances in innovative, generation-connecting ways, such as «Mix@ges – Intergenerational Bonding via Creative New Media», a Grundtvig multilateral project, are prolific. This project, which spans five countries, has explored how the artistic use of digital media can assemble individuals from multiple generations (Fricke, Marley, Morton & Thome, 2013). In the framework of the EU Lifelong Learning Programme (2008-11), 21 projects with a primary interest on intergenerational learning and active ageing through digital skills were launched (European Commission, 2012).

Regarding technology development, we are witnessing an abundance of new software and devices for fostering cross-generational relationships within families (Chen, Wen & Xie, 2012; Davis, Vetere, Francis, Gibbs & Howard, 2008). Gershenfeld & Levine (August 6, 2012) focused on explaining «How can we effectively transform media consumption into quality family time?», by emphasizing video games and their possibilities for facilitating generational encounters in playful learning together. On the same line, Chiong (2009: 22) was able to conclude that «the ubiquity of digital media in children's and adults' lives is an important untapped opportunity for intergenerational contact».

We appreciate how Facebook, Twitter and other social media outlets are assisting families with the ability to stay connected in spite of geographical distance. A 2012 survey which concentrated on how 2000 Americans, ages 13-25 and 39-75 utilize online communication, determined that 83% of respondents considered online communication to be an effective method of touching base with family members. Additionally, 30% of the grandparents and 29% of the teens/young adults reported that through online connections, they better understand each other (AARP, 2012).

In considering certain features of intergenerational programmes with a strong technological component such as area and level of impact, status of generational groups, and centrality of technology, it is useful to reflect more largely on the role of technology in the social lives of both younger and older individuals. The Center for Technology and Aging's recent report, entitled «The new era of connected aging», states that «We are at the dawning of 'Connected Aging' in which the growing array of Internet-based technologies and mobile devices increasingly will support older adults to age in place» (Ghosh, Ratan, Lindeman & Steinmetz, 2013: 1).

However, it is also becoming evident that many individuals with limited access to technology, along with technology skills and support, are less likely to obtain the many social benefits associated with the ongoing and numerous advancements in technology. There is recognition, within the literature on how older adults use Information and Communication Technologies (ICTs), that adoption of new technologies by older adults is neither quick, simple, nor universally accepted (Feist, Parker & Hugo, 2012; Selwyn, Gorard, Furlong & Madden, 2003). Furthermore, within the population of adults aged 65+, older seniors

with lower levels of educational attainment and income are frequently lagging behind in terms of ICT adoption. They are also more likely to have difficulties when using new digital devices, and sceptical attitudes about the benefits of technology (Smith, 2014). On an encouraging note, however, it is also the case that when older adults transcend these obstacles, they tend to become more positive about the online world and adept in utilizing digital technology (Smith, 2014).

In terms of how children/youth use new technologies, here too, the data are mixed. There is certainly potential for technology to contribute to the well-being and development of youth, yet various factors need to be considered, such as the ability of youth to detect and avoid threats which technologies may pose. Fortunately, there is evidence that youth are becoming more high-tech and more able to protect themselves. According to a recent Pew Research Center survey of 802 American youth aged 12-17 and their parents that explored technology use, youth are becoming more skilled at managing the privacy of their online information, including when sharing personal information on their social media profiles, and in taking technical and non-technical steps to keep that information from reaching businesses and advertisers (Madden, Lenhart & al., 2013).

What if we tried to connect different generations around technology issues? In one such example, a group of youth researchers in Australia studying youth online behaviour (Third, Richardson, Collin, Rahilly & Bolzan, 2011) conducted an action research study in which a group of youth facilitated a series of technology education workshops on social networking and cybersecurity for adults. After analysing the subsequent dialogue between the youth and adults, the researchers concluded that the youth in their study could handle the online risks more effectively than most adults anticipated. Many of these youth became proficient in cybersafety issues through informal learning processes, such as peer knowledge sharing and trial and error.

Many technology-oriented intergenerational programmes rely on youth with technology expertise to help older adults navigate and become comfortable with the world of «digital inclusion», while older adult participants contribute to other programme objectives, such as teaching youth about local community history or working collaboratively on community improvement projects. One such example has taken root in a rural community in Scotland: «Young and old would work together; the elders have a vast local knowledge, the young have an intuitive understanding of contemporary technology and practitioners would bring insights from the design sector» (CLD Standards for Scotland Report, 2010: 6).

Over time, new modes of communication become possible. As older adult participants gain technology skills and confidence, they transform themselves into what Ghosh, Ratan, Lindeman & Steinmetz (2013: 12) term as «empowered 'prosumers' of information in the digital world», and the technology-related communication dynamic becomes more multi-directional.

Certain assumptions should be put aside when developing intergenerational programmes with a significant technology component. For example, older adults might be more digitally competent than the participating youth. A survey conducted by EU Kids Online (2011) questioned the common assumption that youth were innately digitally literate. Survey results indicated that only 36% of the participating 9-16-year-olds stated that it was very true that they knew more about the Internet than their parents. This report also highlights limitations in the way many youth are currently using computing. In taking a more nuanced view about how youth engage with technology, it is important to consider the degree to which the content is pre-determined and the extent to which the «televi-

There are many accounts of the ways in which advances in technology can have a negative as well as a positive influence on the lives of older and younger people. For example, within the family contexts the expertise of youth using electronic media and peer-oriented participation in social networks can be a divisive influence on family relations, and sometimes technology functions as both, a barrier and an opportunity

sual» experience promotes passivity. As Hall (2012: 97) states, «[Such characteristics are] particularly problematic for the development of creativity and creative education».

This paper describes results from a survey designed to scan and contextualize the terrain of intergenerational programmes that have a substantial technology component. The identified programmes span a range of family contexts and community settings, and utilize new and emerging technologies to build relationships, promote understanding and facilitate cooperation between generations. In reporting survey results, as you see below, we draw significantly on respondents' survey quotes to demonstrate a composite representation of programme innovation, success and challenge.

2. Material and methods

2.1. Survey

Our project team created a survey aimed at gathering data about intergenerational programmes that have a significant technology component, i.e. programmes in which technology had been included intentionally as a method to connect generations. The survey was organized in two sections: organization/primary contact information, and programme specific questions about the use of technology. In order to identify intergenerational technology programmes to be a part of the survey, project team members utilized a threefold strategy over a 16-week period (from February 1 to May 15, 2013). This strategy included outreach through intergenerational list-serves (managed by local, national, and international membership organizations) and personal contact with intergenerational practitioners, a structured web search (via Google Search), and literature review (via Google Scholar, SCOPUS, and Web of Knowledge) for the period January 1, 2009 to December 31, 2012. The following terms were used in the web search and the literature review: «intergenerational program» and «technology», «intergenerational project» and «technology», «intergenerational activity» and «technology», and «intergenerational technology program». Similar strategies for screening and scoping this type of programmes have already been implemented in the intergenerational field (Bishop & Moxley, 2012; Flora & Faulkner, 2007; Jarrott, 2011).

All programmes retrieved through the web search, literature review and outreach to relevant list-serves were evaluated on the following criteria inspired in previous work by Brophy & Bawden (2005): accessibility (programme is within reach), topicality (programme matches research's subject matter), and relevance (relevant, partially relevant, not relevant) to the study objectives. Only those programmes partially or fully meeting the following three relevance sub-criteria were considered suitable for our sample: (i) facilitating intergenerational engagement is an explicit goal, (ii) the initiative involves more than a single contact or one-time only activity, and (iii) technology is used as a tool to facilitate connections across age groups.

Of the 72 surveys that were completed and submitted, 46 intergenerational programmes[1] were retained for analysis after examining them for redundancy, completeness, and selection criteria.

2.2. Analysis

The project team utilized a mixed-methods analytic strategy (Greene, 2008). After descriptive analysis (ranges and frequencies) of quantitative data, two members of the research team reviewed approximately 25% of the raw data with the overarching purpose of developing response categories to encompass the full range of the survey's qualitative data and frame it in the context of several themes (provisional coding) prevalent in the intergenerational studies literature that addresses issues related to intergenerational communication, relationship formation, and use of technology. Codes (113 in total) were established for a series of variables that fit into four major categories: programme objectives, programme description, technology use, and (perceived) technology importance. Some excerpts were assigned multiple codes according to principles of simultaneous coding (Saldaña, 2009). After several joint coding sessions, two members of the research team then worked independently to review and code the entire database (consisting of 431 excerpts). All differences in coding were reconciled and an acceptable inter-rater reliability rate (pooled Cohen's Kappa) of .93 (Hruschka, Schwartz & al., 2004; Lombard, Snyder-Duch & Campanella, n.d.) was finally achieved.

2.3. Sample description

Information from a total of 46 intergenerational programmes from 11 countries was gathered through the survey. United States (19 programmes), United Kingdom (9 programmes), and Germany (7 programmes) were the most represented countries. There were also 3 programmes from Canada, 2 programmes from Ireland and Portugal, and 1 programme from the rest of countries in the sample (Belgium, Hong Kong, Italy, Romania, and Taiwan).

Regarding time in existence, 33 programmes were 1-3 years old and five of our sampled programmes had

been in place for ten or more years. Age distribution of participants ranged from 0-5 to 85+ years old, with 80.4% and 67.4% of the programmes including 15-24 and 25-54 years old youth and adults, respectively. The least represented age group of programme participants was that of 65-74 years old, with just 19.6% of sampled programmes. The most typical frequency of intergenerational interaction facilitated by programmes in the sample was weekly (28.3%), followed by programmes whose participants interacted 2-3 times per month (19.6%), and daily/almost daily (15.2%).

There was also a question on the survey which asked about the type(s) of technology being used by the respondents' organizations. Computer (desktop) devices, including Smart Boards and iPads, were used by 93.5% of the programmes. Approximately half of the programmes (54.3%) had incorporated online platforms for sharing content and mobile communication devices. Lastly, 19.6% of intergenerational programmes in the study were using gaming platforms, 17.4% had adopted digital cameras and e-readers, 15.2% counted on social media, and 13% used online publishing platforms.

The main question is how intergenerational programmes can apply technology while staying true to underlying goals and corresponding values for promoting intergenerational learning and education in ageing societies. There are many accounts of the ways in which advances in technology can have a negative as well as a positive influence on the lives of older and younger people. For example, within the family contexts the expertise of youth using electronic media and peer-oriented participation in social networks can be a divisive influence on family relations, and sometimes technology functions as both, a barrier and an opportunity.

3. Results

3.1. Intended impact

Table 1 (see next page), below, categorizes the programmes in the survey according to the major area(s) of intended impact. The most frequent category of response is in the focus area of education and learning; survey responses extended to teaching and learning in non-formal as well as formal education settings.

Focusing on the level of intended impact (or change) and examining more closely the respondents' comments about programme objectives, we can differentiate between programmes in terms of whether the intended benefits were targeted to individual participants, families, local organizations and institutions, and/or entire communities.

Most programmes were designed to have a positive impact on the lives of the participants (74%), whether through helping older individuals in developing ICT skills or through raising awareness of and reducing digital exclusion amongst older people. While a majority of these programmes were primarily focused on enhancing individual participants' technology-related knowledge and skills, 24% of the programmes in the sample also targeted non-technology related capabilities such as how to maintain a healthy lifestyle and improve second language skills. Interestingly, 15% of programmes in our sample were not pursuing just individual impact but specific reduction of the sense of isolation or exclusion among older people.

3.2. Technological capacity and status

As noted in Tables 2 and 3, below, youth participants were viewed as having more status (at least when it comes to dealing with matters related to technology) and as being more readily positioned to take on the role of technology tutor or teacher than the adult participants.

Table 3 (see next pages), below, illustrates distinctions in the surveyed programmes with regard to the direction of the technology-related teaching and learning. Although there were significantly more «youth as teacher» responses than «older adults as teachers», the most frequent type of response (63% of programmes) emphasized complementary contributions to both teaching and project leadership. For more detailed analy-

Table 1. Programme objectives in terms of areas of intended impact	
AREA OF INTENDED IMPACT CATEGORY	PERCENTAGE OF PROGRAMMES
Education/Learning	67.4
Technology (as main focus)	32.6
Aging well	30.4
Community improvement	30.4
Cultural continuity	10.9
Family support	13
Work	6.5
Caregiving	4.3

sis, this latter category was broken into two sub-categories: emphasis on joint learning/joint teaching and emphasis on common goals and sense of intergenerational partnership.

3.3. Importance of technology

The programmes that were surveyed utilize a variety of methods to enable cross generational communication, cooperation, and relationship formation. How essential is the technology part of these generation-linking strategies? Table 4, below, addresses this question by distinguishing between respondents' comments regarding the role of technology as being central vs. secondary to the intergenerational engagement within the surveyed programmes.

A disproportionate number of responses (73.9% versus 36.9% of programmes, respectively) underscored that the technology component was of central rather than secondary importance to the fundamental nature of the surveyed programme models.

The illustrative body of responses identified within the category of «blended technology strategies», for example those that incorporate technology-intensive as well as «technology free» components into programme activities, provides some clues with regard to how practitioners weave new technology tools into their cross-age programme activities. For example, one respondent wrote: «Without the smart board, we found that some of the kids were done with an activity before the older adults were finished». In this particular example, access to the smart board technology complements and enhances an existing activity in need of some modification. It is a question of how the face-to-face contact and technology-mediated contact bolster each other.

Respondents indicated many additional aspects of technology that must be considered for programmes:

• Appropriateness of the technology (21.7% of programmes). This includes developing age friendly technology tools and using high-tech equipment to develop appealing ice breaker activities.

• Comfort level (13% of programmes). Emphasis is on using technology that is non-threatening and user-friendly. «The challenge remains getting participants and staff comfortable with the technology».

• Access to the technology (6.5% of programmes): «We are very aware that many of the most valuable local and intergenerational activities within Historypin happen offline -often inevitably offline because of skills and access».

4. Discussion and conclusion

The majority of the intergenerational technology programmes that we examined include an educational function and emphasis, which consists of more than solely learning how to use technology. Reading Table 1 from a diffusion of innovations perspective (Rogers, 2003), the emphasis on learning may just be an early stage, to be followed by a series of steps involving experimentation and, ultimately, adoption of the technology in different formats and contexts. Within the framework of intergenerational practice, the education-learning-technology triangle encloses a rather complex array of possibilities.

The majority of the programmes that we surveyed aspire to have a positive influence on individual programme participants through improving both technology- and non-technology- related knowledge and skills. This knowledge can serve as a conduit for generating new modes of intergenerational collaboration (within and beyond families) and joint social and com-

Table 2. Generational differences in technological capacity		
RESPONSE CATEGORIES	PERCENTAGE OF PROGRAMMES	EXAMPLE QUOTES
Equal status (starting programme on an «equal footing» presumed equal level of competence)	34.8%	«KOJALA is a network of and for older and younger people, who are prepared to share their knowledge and abilities with others».
Youth first (assumed to have an advantage)	32.6%	«The technology is our students' strong suit and an area where our elders feel incompetent».
Older adults first (assumed to have an advantage)	4.3%	«The school2work platform has been developed for mentors in Germany that support young people on their way from school to work».

Table 3. Who teaches whom?		
RESPONSE CATEGORIES	PERCENTAGE OF PROGRAMMES	EXAMPLE QUOTES
1. Youth as teachers	30.4%	«We launched this website to help Ireland's younger generations' to teach their parents and older loved ones how to get the most from the Internet».
2. Older adults as teachers	10.9%	«The Center creates opportunities for residents to continue their passion for teaching young children, as well as being with surrogate grandchildren».
3. Complementary contributions to teaching and project leadership [63% of programmes]		
3.1. Emphasis on joint learning/ joint teaching	41.3%	«By sharing these activities together both adults and children acquire an understanding of shared values and gain increased respect for each other».
3.2. Emphasis on similar goals (and intergenerational partnership)	41.3%	«Unlike many other projects (in) 'Generations,' it was neither sought that the older people teach the younger ones, nor the other way round. Rather, the different groups were supposed to devote equally to both a common task and a common theme. It was therefore judicious not only to stake on a good dialogue, but a dialogue of equals (in eye level), and that right from the very beginning».

munal action; it is not necessarily an endpoint in and of itself. Therefore, attention to individual impact (including learning) is not adopting a fully individualistic approach as it is through the multi-generational strategies cast within relationship-building and shared social and community contexts that efforts with an education component take form.

There is a distinct thread of response that undervalues or under appreciates older people's assets. This orientation for using information technology to enhance the quality of life for older adults can be characterized as «deficit-driven design» in contrast to «positive design». According to Carroll, Convertino, Farroa & Rosson (2011: 7), in the former, «the design intervention orients to and addresses problems, in this case the negatives of growing old alone and isolated, and seeks to mitigate these deficits». However, in positive design, «the design intervention orients to and addresses human or organizational strengths and seeks to leverage but also further strengthen them or facilitate their expression in new activities» (Carroll, Convertino, Farroa & Rosson, 2011: 7).

Earlier in this paper we underscored that often youth participants in intergenerational programmes who have a strong technology component are frequently disproportionally respected for their digital competency and are often positioned in the role of technology teachers/tutors, individually or as equal partners with older adult participants. However, seve-

Table 4. Central vs. secondary importance of technology		
RESPONSE CATEGORIES	PERCENTAGE OF PROGRAMMES	EXAMPLE QUOTES
Centrality of technology to programme	[73.9%]	
References made to the tech-focused nature of project models/activities	43.5%	«The program is entirely dependent upon using technology to remix, share and explore media messages».
Emphasis on tech skills development	21.7%	«The focus was improving the technology skills of older people and the subject was chosen by the pupils - this gave them ownership of the project and the older people were keen to learn».
Emphasis on removing technological barriers	8.7%	«The technology we provide has opened a door that can often times be a barrier; we have made it a pathway».
Technology as secondary	[36.9%]	
Blended technology (the importance of blending tech and non-tech methods)	21.7%	«Virtual contact possibilities have to be combined with face-to-face meetings and learning activities».
Primary emphasis on programme objectives/goals (not the technology)	19.6%	«(Technology is used) as a vehicle and more as a 'pretext' to enhance intergenerational linking and to stimulate intergenerational learning and dialogue. Getting-to-know activities, ice-breakers, tandem and group activities, 'analogue' creative activities (performing and painting) and informal chat in breaks were equally important».
(There are times when) Technology is not needed	6.5%	«My students and I also give educational lectures without using computers, but our main focus is teaching seniors how to play cognitively stimulating games».

ral respondents referenced a multifaceted relationship in which members of both generations make meaningful (and often reciprocal) contributions. The most frequently surveyed model is, when the youth guide the technology education, while the older adults substantially contribute in other ways, such as teaching gerontology students about a topic related to the experience of ageing. The success relies on interlocking goals, and include reciprocity in learning.

As there are so many configurations with regard to participants' technological competencies and the programmatic roles they play, we have found that the dynamic of who does the teaching is not necessarily a generational issue. Reinforcing our conclusions in this regard, we found multiple accounts in the literature that emphasize the technology teaching capacity of young people in work settings (Bailey, 2009), the often significant influence that grandparents have on youth learning about science and technology (Jane & Robbins, 2007), and the power of intergenerational teams to innovate and apply new technologies (Large, Nesset, Beheshti & Bowler, 2006).

The themes of co-learning, collaboration, and the primacy of the intergenerational relationship that were present in the current survey results are also significant in the broader field of intergenerational studies. This is emphasized as a best practice guideline provided in a recent document by ECIL (European Certificate in Intergenerational Learning) emphasizing the importance of encouraging «reciprocal learning» (i.e., opportunities in which the generations learn from and with one another) (ECIL, 2013).

Our intergenerational technology programmes survey represents a preliminary effort to discover how new technological developments are currently being utilized in a range of intergenerational settings and contexts. The data gathered captures some innovative strategies for effectively applying technology to connect generations in such areas of emphasis as enhancing health and wellbeing, strengthening families, and working to improve community life. However, perhaps as an artefact of how the survey was constructed and distributed (e.g., it is a very short and general survey, and the emphasis is on identifying formal intergenerational programmes), we had limited access to experts at the forefront of technological innovation, in areas such as robotics and the construction of new types of technological devices for recording, organizing, and sharing information.

In concluding, we believe that technology is a powerful medium for intergenerational exchange. Our stance, which has remained consistent from before we began this project to its completion, is that technology is value neutral. In framing this technology «neutrality thesis» (Pitt, 2000) from an intergenerational engagement perspective, we not only pay attention to creative, effective, and positive ways in which technology is being used to connect the generations, but also remain cognizant of the potential of technology to delimit authentic intergenerational communication and meaningful understanding. The main question is how intergenerational programmes can apply technology while staying true to underlying goals and corresponding values for promoting intergenerational learning and education in ageing societies. There are many accounts of the ways in which advances in technology can have a negative as well as a positive influence on the lives of older and younger people. For example, within the family contexts the expertise of youth using electronic media and peer-oriented participation in social networks can be a divisive influence on family relations (Figuer, Malo & Bertran, 2010), and sometimes technology functions as both, a barrier and an opportunity (EMIL, 2013: 25).

The results from our survey of intergenerational technology programmes are promising. We learned about various ways in which technological tools and services can help: older adults to have positive ageing experiences and maintain social connectivity; youth to gain skills that contribute to their employability; community residents to preserve local history and take part in local planning endeavours; and family members to stay in contact and maintain lines of social support across geographic distance. The challenge, which many of the programmes that were surveyed confront relates to relationship-building, particularly with regard to discovering ways in which «high tech» can lead to «high touch».

Notes

1 More information about the 46 technology-intensive intergenerational programmes that were surveyed can be found in the online database maintained by Generations United (see http://goo.gl/s-9O0UC). Organizations that run intergenerational programmes with an intensive technology component can fill out an online survey so that these programmes can be added to this database (see http://goo.gl/PyegRb).

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The framework of Media Education and Media Criticism in the Contemporary World: The opinion of International Experts

Situación de la educación en medios y la competencia crítica en el mundo actual: opinión de expertos internacionales

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ABSTRACT

The article analyzes the results of the international survey «Synthesis of Media Literacy Education and Media Criticism in the Modern World», conducted by the authors in May-July 2014. 64 media educators, media critics, and researchers in the field of media education and media culture participated in the survey, representing 18 countries: the USA, the UK, Canada, Australia, New Zealand, Germany, Ireland, Spain, Portugal, Sweden, Finland, Greece, Cyprus, Hungary, Ukraine, Serbia, Turkey, and Russia. Analysis of the data shows that the international expert community on the whole shares the view that the synthesis of media education and media criticism is not only possible, but also necessary, especially in terms of effectively developing the audience's critical thinking skills. However, only 9.4% of the experts believe that media critics' texts are used in media literacy education classes in their countries to a large extent. Approximately one-third (34.4% of the polled experts) believe that this is happening at a moderate level, and about the same number (32.8%) believe that this is happening to a small extent. Consequently, media education and media criticism have a lot of work to do to make their synthesis really effective in the modern world.

RESUMEN

El artículo analiza los resultados de la encuesta internacional sobre la «Situación de la educación en medios y la competencia crítica en medios en el mundo actual», llevada a cabo por los autores en mayo-julio de 2014. Fueron entrevistados responsables de 64 medios de comunicación, educadores críticos e investigadores en el campo de la educación mediática y la cultura de los medios de comunicación de 18 países: USA, Reino Unido, Canadá, Australia, Nueva Zelanda, Alemania, Irlanda, España, Portugal, Suecia, Finlandia, Grecia, Chipre, Hungría, Ucrania, Serbia, Turquía y Rusia. El análisis global de los datos muestra que la comunidad internacional de expertos comparte la convicción de que la situación de la educación en medios y la competencia crítica no es únicamente posible sino también necesaria, sobre todo en términos del desarrollo del pensamiento crítico de la audiencia. Sin embargo, solamente el 9,4% de los expertos en general cree que se utilizan los textos críticos de los medios en las clases de alfabetización mediática en sus respectivos países. Aproximadamente un tercio (34,4% de los expertos encuestados) cree que esto está sucediendo en un nivel aceptable y un porcentaje similar (32,8% de las respuestas) considera que ocurre en una mínima parte. En consecuencia, habrá mucho trabajo que hacer para que la educación en medios y su análisis crítico consiga su implementación eficaz en el mundo actual.

KEYWORDS | PALABRAS CLAVE

Media literacy, media education, media criticism, expert, international survey, functions, genres, critical thinking.
Alfabetización mediática, educación en medios, competencia crítica, experto, encuesta internacional, funciones, géneros, pensamiento crítico.

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1. Introduction and state of the question

One of the most important components of media literacy education is teaching the audience to analyze media texts of different kinds and genres. That is where, in our opinion, media criticism serves as an effective ally (Downey, Titley & Toynbee, 2014; Hermes, Van-den-Berg & Mol, 2013; Kaun, 2014; Masterman, 1985; Silverblatt, 2001; Potter, 2011). Media criticism is an area of journalism, a creative and analytical activity that requires the exercising critical awareness and the evaluation of information produced by mass media, including its social significance, relevance, and ethical aspects (Korochensky, 2003). These objectives are linked to using and analyzing media information of different genres, forms and types: and identifying economic, political, social, and/ or cultural interests connected to it.

Media criticism can be divided into academic (e.g. publication of research findings related to media understanding, aimed mainly at specialists in the field of media studies and professors/instructors in media departments); professional (publications in journals aimed at media industry professionals); and general (aimed at a general audience) (Bakanov, 2009; Korochensky, 2003; Van-de-Berg, Wenner & Gronbeck, 2014). Thus, it is primarily media critics in mass periodicals, along with media educators who strive to raise the media literacy level of the mass audience.

Media competence is multidimensional and requires a broad perspective, based on well-developed foundational knowledge. It is not a fixed category: theoretically, one can raise his/her media competence level, by perceiving, interpreting, and analyzing cognitive, emotional, aesthetic and ethical media information. The audience that is at a higher level of media literacy has a higher level of understanding and ability to manage and evaluate the world of media (Camarero, 2013; Fantin, 2010; Huerta, 2011; Potter, 2011: 12).

There are still pragmatic pseudo-media education approaches –in which real media education is substituted by teaching elementary media skills or encouraging greater media consumption– in use today (Razlogov, 2005). The danger of such a simplistic attitude to media education has been emphasized by many researchers (for instance, Wallis & Buckingham, 2013).

Media criticism has great potential to facilitate educational efforts to develop the audience's media culture. Again, it is a common feature between media criticism and media education, because one of the main objectives of media education is not only to teach the audience textual analysis techniques, but also to understand the mechanisms of their construction and function.

Moreover, British media educators (Bazalgette, 1995, Buckingham, 2006: 271-272 and others) among the six key aspects of media education emphasize the agency, the category, the technology, the media language, the representation and the audience. As a matter of fact, the same key aspects of media are subject to media criticism, appealing to both the professional and the mass audience. This is why a solid connection between media criticism and media education is so important (Hammer, 2011; Potter, 2011).

2. Materials and methods

We conducted an international survey, entitled «Synthesis of Media Literacy Education and Media Criticism in the Modern World», and analysis from May 2014 through early July 2014. We sent out 300 questionnaires to specialists in the fields of media criticism and media literacy education from different countries. The choice of experts was determined by their influence and leadership in the academic community and the number of research articles on the theme they had published in peer-review journals.

On the whole we surveyed 64 media educators, critics, and researchers in the field of media education and culture from 18 countries: the USA, the UK, Canada, Australia, New Zealand, Germany, Ireland, Spain, Portugal, Sweden, Finland, Greece, Cyprus, Hungary, Ukraine, Serbia, Turkey, and Russia. Of these 50% (32 people) were from Western countries, while 32 people were from Russia and Ukraine. The list of

Table 1. What functions of media criticism do you consider the most important for media literacy education of mass audience?

Media criticism functions	Number of experts' votes (%):		
	Russia & Ukraine	Western countries	Total
Analytical	84.4	90.6	87,5
Ideological, political	49.8	68.7	56.2
Info-communicational	59.4	59.4	59.4
Educational	75.0	71.9	73.4
Entertaining, recreation	6.2	31.2	18.7
Regulatory, corporate	18.7	18.7	18.7
Advertising	9.4	40.6	25.0
Artistic, aesthetic	53.1	62.5	57.8
Ethical	59.4	65.6	62.5
Other functions	6.2	18.7	12.5
difficult to say	0.0	6.2	3.1

Table 2. What media criticism genres do you consider to be the most significant/relevant for mass media literacy education?

Genres of media criticism	Number of experts' votes (%):		
	Russia & Ukraine	Western countries	Total
Analytical article about events and processes (present or past) in media sphere	87.5	75.0	78.1
Comments on a media topic	46.9	68.7	57.8
Interview, talk, discussion with media personalities	78.1	31.2	54.7
Film/radio/TV/internet short review	40.6	46.9	43.7
Film/radio/internet long review of the specific media text	43.7	40.6	42.2
Memoirs on a media topic	12.5	3.1	7.8
Open letter on a media topic	12.5	15.6	14.1
Essay on a media topic	34.4	53.1	43.7
Parody on a media topic	12.5	46.9	29.7
Report on a media topic	34.4	37.5	35.9
Portrait (characteristics) of a person from media sphere	37.5	18.7	28.1
Pamphlet, satire on a media topic	18.5	25.0	21.9
Other genre	6.2	15.6	10.9
Difficult to say	0.0	0.0	0.0

experts includes such prominent media educators and researchers of media culture as Kathleen Tyner, Faith Rogow, W. James Potter, Marilyn A. Cohen, John Pungente, Ignacio Aguaded, Georgy Pocheptsov, Hanna Onkovich, Sergey Korkonosenko, Alexander Korochensky, Kirill Razlogov, and other experts to whom the authors are sincerely grateful.

3. Instruments

Thus, the first point of our survey offered experts a list of media criticism functions, of which they had to choose the most important ones, in their opinion. Table 1 shows the results of the first question. The second question dealt with the genres of media criticism that are most applicable to media education.

The third question of the survey dealt with media criticism's degree of compliance with media education functions towards the mass audience. The results are represented in table 3.

The fourth question of the survey concerned the experts' evaluation of the degree of integration of media criticism and media education in public education institutions in their home countries (see table in the next page).

The fifth question related to the experts' estimation of the degree to which certain texts by media critics are used in media education classes in their countries (see table in the next page).

The sixth question dealt with the experts' estimation of which media education objectives can be more effectively reached if supported with the use of media critics' texts. The findings are reflected in the following table.

The seventh question of the survey related to the experts' self-assessment of the extent they synthesize media literacy education and media criticism in their teaching practice (see table in the next page).

4. Results – Discussion and conclusions

The analysis of table 1 shows that the vast majority of experts (87.5%) support the analytical function of media criticism as the most relevant for mass media education. Then follow educational (73.4%), ethical (62.5%), informational-communicative (59.4%), aesthetical (57.8%), ideological/political (56.2%) and ethical (54.7%). The rest of the functions of media criticism (entertaining, recreation; regulatory, corporate; advertising) did not gain the vote of more than 25% of the experts.

Only 12.5% of experts added other functions of media criticism; among them were the functions of critical thinking development, the audience's socialization, and learning about the economic organization of media and its impact on what is produced. The latter, as rightly mentioned by one of the experts, is very important for facilitating discussion of such questions as: what kind of media landscape would we have if

Table 3. To what degree does media criticism in your country exercise media literacy education function aimed at the mass audience (audience of mass press, television, and Internet)?

Media criticism in my country exercises media literacy education function aimed at mass audience (audience of mass press, television, and Internet)	Number of experts' votes (%):		
	Russia & Ukraine	Western countries	Total
To a considerable degree	0.0	12.5	6.2
Somewhat	37.5	43.7	40.6
Very little	56.2	37.5	46.9
Difficult to say	6.2	6.2	6.2

Table 4. How does media criticism integrate with media literacy education of school and university students?

Media criticism integrates with media literacy education of school and university students in my country	Number of experts' votes (%):		
	Russia & Ukraine	Western countries	Total
To a considerable degree	0.0	15.6	7.8
Somewhat	15.6	50.0	32.2
Very little	81.2	31.2	56.2
Difficult to say	3.1	3.1	3.1

everything was financed by selling advertising? Is there still a role for public service media financed out of taxation, and if so, what is that role? Should websites like Facebook be allowed to sell personal data about their users?

We should mention here that while developing the survey, we implied that the function of critical thinking development is a part of the analytical function.

However, if we compare the answers of the experts from post-Soviet countries (Russia and Ukraine), on the one hand and experts from the Western countries, on the other hand, then we are able to see that their views on analytical, informational-communicative, educational, ethical, regulatory, corporate, artistic, and aesthetic functions of media criticism correspond closely, but their opinions about other functions differ substantially. For example, the ideological/political function, gained 49.8% of Russian and Ukrainian experts' votes and 68.7% of Western experts' votes. Entertainment and recreation gained 6.2% of Russian and Ukrainian experts' votes and 31.2% of Western experts' votes. Advertising gained 9.4% of Russian and Ukrainian experts' votes and 40.6% of votes). This considerable difference (ranging from 18 to 31%) demonstrates that Western media educators, critics, and researchers place much more emphasis on the ideological, entertainment, and advertising functions of media criticism. We believe that this can be explained by the fact that media education in post Soviet countries has paid little attention to advertising and entertainment genres until recently; and intensive imposition of communist ideology during the Soviet regime led to media teachers' wary attitude to ideology functions in the post-Soviet era.

The analysis of table 2 demonstrated that the most relevant media criticism genres for media education are considered to be analytical articles about events and processes (present or past) in the media sphere (78.1% experts' votes), comments on a media topic (57.8%), interview, talk, discussion with media personalities (54.7%), short review (film/radio/TV/Internet) (43.7%), essay on a media topic (43.7%), long review

Table 5. Are media critics' texts used in media literacy education classes in your country?

Concrete texts of media critics are used in media literacy education classes in schools and universities in my country	Number of experts' votes (%):		
	Russia & Ukraine	Western countries	Total
To a considerable degree	9.4	9.4	9.4
Somewhat	15.6	53.1	34.4
Very little	43.7	21.9	32.8
Difficult to say	31.2	15.6	23.4

Table 6. What media literacy education objectives can be facilitated by using media critics' texts in media literacy education classes?

Media literacy education objectives that can be endorsed through using media critics' texts	Number of experts' votes (%)		
	Russia & Ukraine	Western countries	Total
Development of good aesthetic perception, taste, understanding, and appreciation of artistic qualities of a media text	59.4	46.9	53.1
Development of analytical / critical thinking, autonomy of the individual in terms of media	90.6	84.4	87.5
Protection from harmful media effects	62.5	56.2	59.4
Satisfaction of various needs of the audience in terms of media	21.9	40.6	31.2
Development of skills of Political / ideological analysis of different aspects of media / media culture	68.7	81.2	75.0
Development of the audience's skills to perceive, understand and analyze the language of media texts	65.6	68.7	64.1
Development of the audience's skills to conduct morals, spiritual, and psychological analysis of aspects of media / media culture	59.4	37.5	48.4
Amplification of analytical skills related to cultural, and social context of media texts	56.2	68.7	62.5
Preparation of the audience for living in a democratic society	43.7	68.7	56.2
Development of communicative skills of the individual	28.1	28.1	28.1
Encouraging audience's ability to create and publish their own media texts	40.6	65.6	53.1
Learning about history of media / media culture	34.4	46.9	40.6
Learning about theory of media / media culture	31.2	50.0	40.6
Other objective	3.1	3.1	3.1
Difficult to say	0.0	0.0	0.0

of a specific media text (film/radio/Internet) (42.2%), and report on a media topic (35.9%). The remaining media criticism genres (memoir on a media topic, open letter on a media topic, parody on a media topic, portrait (characteristics) of a person from the media, pamphlet, satire on a media topic) did not exceed 30% of the experts' votes. Only 10.9% of experts supplied other genres. They mentioned pitches, presentations, intercultural dialogue, open discussions, evaluation of public service announcements, readers' Internet forum inspired by a media critic's publication, etc. In our opinion, this attests to the fact that we have managed to represent the main genres of modern media criticism in our survey.

Table 7. In what way do you (as teacher/instructor/professor in case you teach) use synthesis of media literacy education and media criticism?

As a teacher I integrate media criticism and media literacy education...	Number of experts' votes (%):		
	Russia & Ukraine	Western countries	Total
To a considerable degree	21.9	56.2	39.1
Somewhat	31.2	28.1	29.7
Very little	34.4	12.5	23.4
Difficult to say	12.5	3.1	7.8

However, if we compare the answers of experts from post-Soviet countries (Russia and Ukraine) and experts from the Western countries, then we can see that while they are quite close in their views about such genres of media criticism as short review (film/-radio/TV/Internet), long review of a specific media text (film/radio/Internet), open letter on a media topic, report on a media topic, pamphlet, and satire on a media topic, they differ drastically about such genres as comments on a media topic (experts from Russia and Ukraine, 46.9% of votes, Western experts, 68.7%), interview, talk, or discussion with media personalities (experts from Russia and Ukraine, 78.1%, Western experts, 31.2%), memoir on a media topic (experts from Russia and Ukraine, 12.5%, Western experts, 3.1%), essay on a media topic (experts from Russia and Ukraine, 34.4%, Western experts, 53.1%), parody on a media topic (experts from Russia and Ukraine, 12.5%, Western experts, 46.9%), portrait (characteristics) of a person from the media (experts from Russia and Ukraine, 37.5%, Western experts, 18.7%).

This significant difference (reaching 47% in the case of interview, talk, or discussion with media personalities) shows that in Western countries, media educators, critics and researchers lay more emphasis on entertaining genres of media criticism (e.g. a parody) on the one hand, and on the other hand – prefer contents and composition of «loose» media criticism genres (such as comments and essays). At the same time the analysis of the data in table 2 shows that Russian and Ukrainian experts tend to a larger degree to prioritize genres popular in the post-Soviet media such as interview, talk, or discussion with media personalities and memoirs on a media topic. However, let us bear in mind that it is about priorities, because in their comments many experts wrote that all the suggested genres are important.

The analysis of data in table 3 shows that on the whole experts think that media criticism realizes educational functions on a medium level (40.6% of surveyed experts) or to a small extent (46.9%). Only 6.2% of experts believe that media criticism exercises educational functions to a great degree in their home countries. In the meantime, if the answers of experts from post-Soviet countries (Russia and Ukraine) are compared to the answers of their Western colleagues, we can see that the latter are more optimistic: 12.5% of them do believe that media criticism performs educational functions to a large extent and 43.7% – to a medium extent. However, more than one third of the experts from western countries believe that media criticism has little educational effect. These data, in our opinion, testify to the fact that even in European and North American countries, according to experts' views, the media educational potential of criticism most often remains untapped.

The analysis of the data in table 4 indicates that only 7.8% of experts in general consider that media criticism is integrated with the media literacy education of school and university students to a considerable degree. About one third (32.2% of those polled) think that this integration is at the medium level, and over one half (56.2%) – to a small degree.

Still, comparing the answers of experts from post-Soviet countries on the one hand, and the Western countries on the other hand, we can trace the difference: 15.6% of the latter are sure of considerable degree of usage of media criticism in media education classrooms in schools and universities, while all the experts from Russia and Ukraine left this column blank. This means that experts from post-Soviet countries do not see the examples of considerable integration of media criticism and formal education practices, so it is only logical that 81.2% of them claim that this process is developing very little in their countries. This is accounted for by for the sad fact that the media criticism potential remains untapped in educational institutions.

Table 5 demonstrates that 9.4% of experts in general believe that media critics' texts are used in media literacy education classes in their countries quite often. Around one third (34.4% of those polled) think that the educational application of concrete texts of media critics is implemented at a medium level, and about the same number (32.8% of votes) consider that this is almost not happening.

Among the names of media critics whose texts are widely used in educational practices, Western experts mentioned Marshall McLuhan, David Buckingham, Roland Barthes, Noam Chomsky, Neil Postman, and Denis McQuail, and experts from Russia and Ukraine referred to Irina Petrovskaya, Alexander Korochensky, Georgy Pocheptsov, Roman Bakanov, and Len Masterman. A closer look at these names reveals that Western experts mostly named well-known English-speaking authors (UK, USA, and Canada). For example, authors from Australia and Northern Europe have entered this list at minimum, and Russian and Ukrainian authors were not included at all. On the contrary, experts from Russia and Ukraine gave preference to Russian-speaking authors. In our opinion, this fact confirms the general tendency of both the Western and post-Soviet expert community not to address the wider spectrum of their colleagues' works but instead to focus on a familiar names, mainly from countries that share their mother tongue.

However, if we compare the answers of experts from post-Soviet countries (Russia and Ukraine) and those from the Western countries, then we can see that the number of Western experts that are sure of a moderate level of media criticism application in educational institutions is over one half (53.1%, vs. 15.6% of experts from post-Soviet countries). 43.7% of Russian and Ukrainian experts are sure that this process is undeveloped and one third (31.2%) found it difficult to answer this question at all.

These data, to our mind, account for the fact that in experts' opinion, specific texts by media critics are used in media education practice in schools and universities little or only somewhat. This correlates to the data from table 4 as well.

The analysis of table 6 demonstrates that, according to the experts' opinions, the most important media literacy education objectives that can be facilitated by using media critics' texts in media literacy education classes are the following:

• Development of analytical/critical thinking, autonomy of the individual in terms of media (87.5% of those polled).

• Development of skills of political/ideological analysis of different aspects of media/media culture (75.0%);

• Development of the audience's ability to perceive, understand and analyze the language of media texts (64.1%).

• Amplification of analytical skills related to the cultural and social context of media texts (62.5%).

• Protection from harmful media effects (59.4%).

• Preparation of the audience for living in a democratic society (56.2%).

• Development of good aesthetic perception, taste, understanding, and appreciation of artistic qualities of a media text (53.1%).

• Development of the audience's ability to create and publish their own media texts (53.1% of respondents).

If we compare the answers of the experts from post-Soviet countries (Russia and Ukraine) and experts from Western countries, then we can see the relatively similar views about such media education objectives as the development of analytical/critical thinking, autonomy of the individual in terms of media, protection from harmful media effects, development of the audience's skills in perceiving, understanding and analyzing the language of media texts, and development of communicative skills of the individual. The positions of experts in Russia and Ukraine differ considerably from Western experts about such objectives as:

• Preparation of the audience for living in a democratic society (experts from Russia and Ukraine –43.7% of votes, Western experts– 68.7%).

• Development of the audience's ability to create and publish their own media texts (experts from Russia and Ukraine –40.6%, Western experts– 65.6%),

• Development of the audience's skills in carrying out moral, spiritual, and psychological analysis of aspects of media and media culture (experts from Russia and Ukraine –59.4%, Western experts– 37.5%).

• Satisfaction of various needs of the audience in terms of media (experts from Russia and Ukraine –21.9%, Western experts– 40.6%).

- Learning about the theory of media and media culture (experts from Russia and Ukraine –31.2%, Western experts– 50.0%).

• Learning about the history of media and media culture (experts from Russia and Ukraine –34.4%, Western experts– 46.9%).

• Development of good aesthetic perception, taste, understanding, and appreciation of artistic qualities of a media text (experts from Russia and Ukraine – 59.4%, Western experts– 46.9%).

• Development of skills of political/ideological

analysis of different aspects of media/ media culture (experts from Russia and Ukraine –68.7%, Western experts– 81.2%).

• Amplification of analytical skills related to cultural, and social context of media texts (experts from Russia and Ukraine –56.2%, Western experts– 68.7%).

This significant difference (ranging from 12% to 25%) demonstrates that Western media educators, critics, and researchers place more emphasis on the preparation of the audience for living in a democratic society, developing the audience's ability to create and publish their own media texts, satisfaction of various needs of the audience in terms of media, learning about theory and history of media and media culture, development of skills of political/ideological analysis of different aspects of media/media culture, and amplification of analytical skills related to the cultural, and social context of media texts. On the other hand, Russian and Ukrainian educators, critics, and researchers emphasize the development of the audience's skills in carrying out moral, spiritual, and psychological analysis of aspects of media, and media culture; and development of good aesthetic perception, taste, understanding, and appreciation of the artistic qualities of a media text. Developing the audience's ability to create and publish their own media texts, satisfaction of various needs of the audience in terms of media, and learning about the theory and history of media and media culture get less attention.

We think that these differences are connected to the fact that the development of the audience's skills in carrying out moral, spiritual, and psychological analysis of aspects of media and media culture and development of good aesthetic perception, taste, understanding, and appreciation of artistic qualities of a media text are traditional points of emphasis for the media education of the Soviet and post-Soviet period, while the preparation of the audience for living in a democratic society is more typical of the Western approach.

As for the development of skills of political/ideological analysis of different aspects of media/media culture, the differences in approaches, as reflected in table 1, are linked to the fact that the imposition of communist ideology in Soviet times led to a skeptical attitude toward this function later on.

The analysis of data in table 7 shows that 39.1% of experts in general think that as teachers they integrate media criticism and media literacy education to a considerable degree, and 29.7% of experts believe that they do this somewhat. However, only one-fourth of experts confess that they integrate media criticism little in their classes.

Additionally, if the answers of Russian and Ukrainian experts are compared to the answers of their Western colleagues, one can see that the number of Western professionals sure of considerable integration of media criticism in their classes is over one-half (56.6%) while in post-Soviet countries this number is only 21.9%.

In our opinion, the synthesis of media education and criticism is very important. For this reason, the discussion about the role and function of media in society and analysis of various media texts in educational institutions is very important. Both media criticism and education have great potential in terms of the support of the efforts of educational institutions to develop the media competence of the audience.

While one-third (34.4%) of Russian and Ukrainian specialists acknowledge the weak degree of application of media criticism in their classrooms, only 12.5% of Western experts hold the same view.

These data, in our opinion, attest that:

• Even among the expert community around half (53.1%) integrate media criticism and media literacy education fairly little or very little.

• Russian and Ukrainian media educators integrate criticism in their classrooms far less than their western colleagues.

This is in spite of the fact that, according to the table 3 data, the majority of experts do recognize that the educational potential of media criticism in educational institutions remains untapped.

Because of the conflicting political, economic and

media situation around Ukraine that occurred in 2014, we considered it essential to compare not only the differences in expert opinions between post-Soviet countries and Western countries, but between Russian and Ukrainian ones as well. With all the similarities of approaches detected by the survey answers, it appears that many Ukrainian experts are sensitive about the correlation of the current political situation with the position of media criticism in education.

Despite the relatively small number of respondents, it is important to note that the survey results to one of the key questions, shown in table 6 (What media literacy education objectives can be facilitated by using media critics' texts in media literacy education classes?) almost completely coincided with the results of our previous sociological research (Fedorov, 2003). In 2003 we surveyed 26 experts in the field of media education/literacy from 10 countries. In particular, they answered questions about the main objectives of media education/media literacy. The comparative analysis of both surveys reveals the following characteristic congruence about the objectives of media education:

- Development of analytical/critical thinking, autonomy of the individual in terms of media (84.3% in 2003 and 87.5% in 2014).
- Development in the area of cultural/social media context (61.5% in 2003 and 62.5 in 2014).
- Development of good aesthetic perception, taste, understanding, and appreciation of artistic qualities of a media text (54.9% in 2003 and 53.1 in 2014).
- Development of the audience's ability to create and publish their own media texts (53.8% in 2003 and 53.1 in 2014).
- Learning about the history of media and media culture (37.8% in 2003 and 40.6% in 2014).
- Learning about the theory of media and media culture (47.9% in 2003 and 40.6 in 2014).
- Preparation of the audience for living in a democratic society (61.9% in 2003 and 56.2 in 2014).

However, there are some differences, for example, the objective of the development of communicative skills of the individual (57.3% in 2003 and 28.1% in 2014). In our opinion, this fact is not connected to a decrease in number of experts who chose this media education objective as one of the most important in 2014, because the share of Western experts in the 2003 questionnaire remained almost the same in 2014 (in the survey of 2003 14 (53.8%) Western experts were among the 26 participants, and in 2014 – 32 (50%) Western experts out of 64 respondents). We tend to believe that the fall in popularity of the objective of the development of communicative skills is due to the fact that 2014 experts reasonably think that communicative skills development by itself cannot be the aim of media education. There are now more vital objectives such as development of analytical/critical thinking, autonomy of the individual in terms of media, development of skills of political/ideological analysis of different aspects of media/media culture, amplification of analytical skills related to the cultural and social context of media texts, and preparation of the audience for living in a democratic society (56.2% of votes).

Quite reasonably, one of the leading Russian experts added in the margins of our survey that the development of mass media criticism in Russia as well as in foreign countries is hindered by the lack of interest on the part of the authorities and the media business in having a media-competent audience of active citizens (which is an essential prerequisite of democratic development in a modern media saturated society). But media criticism is more and more often used as a new information propaganda resource, used to

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influence communities of media professionals and mass audiences during crisis situations.

To sum up, media criticism and education have a lot in common: for instance, both media education and criticism place great emphasis on the development of analytical thinking in the audience. One of the main objectives of media education is, in fact, to teach the audience not only to analyze media texts of various types and genres, but to understand the mechanisms of their construction and functioning in society. As a matter of fact, media criticism deals with the same thing, appealing to professional and mass audiences. Therefore, in our opinion, the synthesis of media education and criticism is very important. For this reason, the discussion about the role and function of media in society and analysis of various media texts in educational institutions is very important. Both media criticism and education have great potential in terms of the support of the efforts of educational institutions to develop the media competence of the audience (Buckingham, 2003; Fenton, 2009; Hobbs, 2007; Korochensky, 2003; Miller, 2009; Sparks, 2013). We should expand the participation of academic communities, researchers, specialists in different fields (teachers, sociologists, psychologists, cultural studies experts, journalists and philosophers), institutions of culture and education, social organizations and funds in order to promote the development of media literacy/media competence of the citizens, and to create organizational structures able to implement the whole spectrum of media education objectives in alliance with media critics.

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University Teaching with Digital Technologies

Enseñar con tecnologías digitales en la Universidad

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ABSTRACT

This research aims to analyze the level of use of technology by university teachers. We are interested by the frequency of their use in designing the teaching-learning process. The research questions were: what types of learning activities which include are designed by university teachers? What types of technologies do teachers use in the design of their instruction? What is the level of use of digital technologies in the learning designs? To respond to these issues, we designed an inventory of activities of learning technologies at the university which was completed by 941 Andalusian teachers. We have identified the type and frequency of use of technology by university lecturers in their different fields at the same time as studying learning activities that predominate in their learning designs. The results, first of all, reveal a poor integration of ICT in the teaching-learning processes which are, essentially, the teacher-centered learning activities. Secondly, we have identified four profiles which differentiate between teachers depending on their level of use of ICT. The profile comprising an increased number of teachers makes reference to their rare use of technology. There are teachers who use technology sparingly, and this is a very small range.

RESUMEN

Esta investigación tiene por objetivo analizar el nivel de uso que de las tecnologías hace el profesorado universitario, interesándose tanto por la frecuencia de uso de ellas, como por el tipo de actividades de aprendizaje en las que se utilizan. Los problemas de investigación se centraron en: ¿qué tipos de actividades de aprendizaje con tecnologías diseñan los docentes universitarios?, ¿qué tipo de tecnologías utilizan los docentes en el diseño de su enseñanza?, ¿cuál es el nivel de uso de las tecnologías digitales en los diseños del aprendizaje del profesorado universitario? Hemos diseñado el Inventario de Actividades de Aprendizaje con Tecnologías en la Universidad que fue respondido por 941 docentes andaluces. A través de él hemos identificado el tipo y frecuencia de uso que de la tecnología hace el profesorado universitario en sus materias al tiempo que hemos estudiado las actividades de aprendizaje que predominan en sus diseños del aprendizaje. Los resultados revelan una pobre integración de tecnologías en los procesos de enseñanza-aprendizaje los cuales se constituyen, esencialmente, de actividades de aprendizaje centradas en el docente. Hemos identificado cuatro perfiles diferenciados de docentes en función del nivel de uso que hacen de las TIC. De los cuatro, el perfil que mayor número de docentes agrupa es el que hace referencia a un uso poco frecuente de la tecnología; son docentes que emplean escasamente la tecnología y esta es de una gama muy reducida.

KEYWORDS | PALABRAS CLAVE

Technology, learning design, higher education, inventory, university teaching, activities, learning, teachers.
Tecnología, diseño del aprendizaje, universidad, inventario, enseñanza universitaria, actividades, aprendizaje, profesores.

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1. Introduction and state of the question

Universities in Spain have gone through a complex process to redesign standards and curricula, mandatory with the implementation of the European Higher Education Area (Guerra, González & García, 2010; Krücken, 2014). Changes introduced in European universities have revealed the need to prioritize a teaching model that is oriented to the students' learning, in which the incorporation of digital technology is ever more important as a support to facilitate the motivation process and students' independent learning. As such, a number of reports and recommendations from the European Union have indicated the need to promote empowerment and digital skills among students (Ferrari, Punie & Brecko, 2013).

However, the successful integration of technologies in the teaching-learning process arises when teachers focus their attention less on the technological resources, and more on the actual leaning experience they design using acceptable technology. In recent years, there has been increased concern about studying learning design (Laurillard, 2012). When we talk about learning design, we are referring to the planning exercise carried out by teachers (Dobozy, 2011). There has been extensive research into this topic; some have focused upon clarifying exactly which knowledge and skills are necessary for good design practice (MacLean & Scott, 2011). Others have centered on what cognitive resources are activated when teachers design their teaching (Goodyear & Markauskaite, 2009; Kali, Goodyear & Markauskaite, 2011).

Teachers are continually designing. It is part of their daily tasks. Sometimes, this learning design is explicit while on other occasions, it is implicit. Teachers are expected to incorporate digital technology, not only in their teaching design process, but also in the development of this design when in contact with their students (Jump, 2011).

The results of previous research reveal that there is no evidence that would lead us to the conclusion that in universities classrooms have successfully integrated a wide range of technologies to support the teaching-learning process (Hue & Jalil, 2013; Ng'ambi, 2013). Thus, Shelton (2014) differentiates between «core» and «marginal» technologies; in other words, frequently used technologies (such as PowerPoint) and hardly used technologies (including blogs, podcasts, e-portfolios, wikis or social networks). Kirkwood & Price (2014) analyzed how technology had been incorporated into the teaching practice within the university context after reviewing a wide range of scientific articles, published between 2005 and 2010. They found that in at least 50% of cases, technology had been used without changing the teaching method. For example, it was simply a matter of opening a new channel for the transmission of information. According to Hue & Jalil (2013), the frequency with which technology is used in the teaching-learning process is associated with attitudes regarding the integration of ICTs in the curriculum to improve teaching.

According to Hue & Jalil (2013), the frequency with which technology is used in the teaching-learning process is associated with the attitudes of teachers towards the integration of ICTs in the curriculum to improve teaching. It is all a matter of being able to explain why teachers decide to use or not to use technology; so we have taken into consideration the practical knowledge and beliefs that teachers develop.

To explain why lecturers decide to use technology, we must take into consideration their own practical knowledge and the beliefs that they develop. One relevant framework to understand lecturer knowledge was developed by Shulman (1986); it was later modified by Grossman (1990) among others. According to Shulman, a teacher's knowledge base is composed of his/her knowledge about the material (content knowledge or CK), knowledge of teaching strategies and classroom management (pedagogical knowledge or PK) and pedagogical content knowledge (PCK) which represents a combination of the first two. Based on the work of Shulman, Mishra & Koehler (2006) proposed a model to integrate technological knowledge as a new type of knowledge to be incorporated into those already mentioned. Thus, the knowledge types proposed by these authors are: technological knowledge (TK), techno-pedagogical knowledge (TPK), technological content knowledge (TCK) and techno-pedagogic content knowledge (TPACK). Based on this model, other authors such as Cox & Graham (2009) moved forward with the conceptualization of each construct and the limits of each. Doering, Veletsianos & Scharber (2009) and Hechter, Phyfe & Vermette (2012), on the other hand, helped us understand that TPACK may appear in a variety of ways, in various contextual conditions, given that there are fluctuations in the relevance of each type of knowledge throughout the teaching-learning process. Yeh, Hsu, Wu, Hwang & Lin (2014), believing that a model still needed to be developed that considers both knowledge and teaching practice, offer a representation (practical-TPACK) that focuses on the TPACK that professors apply practically when they understand the content of the material, design their study plans, teach or assess their students' progress.

However, although technological knowledge is necessary, it is not enough if teachers fail to consider themselves confident when using it (Ertmer & Ottenbreit-Leftwich, 2010). It is evident that lecturers' general beliefs as well as their pedagogical beliefs and attitudes greatly influence their use of ITCs in the classroom (Tejedor, Garcia-Valcarcel & Prada, 2009).

2. Material and method

This research analyzes how the various digital technologies are integrated into university classrooms in Andalusia (Southern Spain). We are interested in learning more about understanding the technological usage level, not as an isolated item, but how it is incorporated into the learning sequences which use it. The research problems in this work are: What type of learning activities using technology do university lecturers design? What technologies do lecturers use in their teaching design? What is the digital technology usage level in the learning designs of university lecturers?

> Technology alone does not change the learning environment. It requires a more intense intervention in which technology accompanies teaching and learning strategies that not only prioritize the acquisition of knowledge based on digital resources, but that are based on the appropriation processing of this knowledge by students through productive, experiential or communicative learning activities.

2.1. The Inventory of Learning Activities with Technologies at the University

To respond to these questions, we have designed an Inventory of Learning Activities with Technologies at the University. Other researchers analyzing TPACK have developed various instruments. Abbitt (2011) provides an extensive review of the instruments and methods being used to assess TPACK. To date, the instruments developed generally focus upon analyzing TPACK elements, thus leaving the didactic aspect, which represents the design of learning activities enriched with technologies, to one side.

The Inventory we designed includes initial questions to collect demographic information such as: sex, age, university, field of knowledge and professional category. Another 38 items are also included in the Inventory. Each of these items refers to a specific learning activity and various types: Assimilative, Information management, communicative, productive, experiential and evaluative (Conole, 2007; Marcelo, Yot & al., 2014). These activities may or may not appear in the classroom context; likewise, these may or may not require students' active participation, but in all cases, digital technologies are involved. Moreover, the items represent learning activities with varying levels of complexity (Aubusson, Burke, Schuck, Kearney & Frischknecht, 2014).

Each of the items had to score from 1 to 6 on a double Likert scale. One refers to the frequency with which it is used (usage level) while the other refers to the degree to which the teacher feels confident when using the activity (confidence level).

The inventory was subject to a validation process by experts. Sixteen university lecturers from various universities and fields of knowledge reviewed the inventory, expressing their level of agreement with each statement, and provided suggestions that should be considered. Regarding their answers, we calculated the Fleiss' kappa coefficient to learn the concordance among the expert assessors. In that analysis, Z obtained a value of 0.00667341 which corresponded to the value p=0.74250178 (greater than an alpha of 0.05). From there, we can state, with a confidence level of 95%, that there was statistically significant concordance among the values assigned to the various items by the 16 judges.

Once the final version was ready, the inventory was launched on the online survey service (http://goo.gl/ukpTme). It was distributed by email to practically all instructors at the various universities located in Andalusia. To measure the reliability of the inventory, the Cronbach's Alpha coefficient was calculated. The coefficient for the scale measuring the usage level of each item was 0.905.

2.2. Sample

The research population is university lecturers from ten universities in the Andalusian region of Spain: nine public and one private. The International University of Andalusia (Universidad Internacional de Andalucía) was excluded due to its specific characteristics. Based on a recent report regarding the 2011-2012 academic year, Andalusian universities had a population of 17,637 lecturers. From this population, which could have undergone slight modifications, the sample was constituted with the 941 university instructors who responded to the inventory. This represents approximately 5.4% of the entire population. Of these, 52.5% were men and 47.5% were women. 42.6% of the subjects were between 41 and 50 years of age, 28% were between 51 and 60 years of age, and 21% between 31 and 40. Lecturers under thirty accounted for 2.7% of the total while 5.8% of the teaching staff was over the age of 61. The percentage of women was greater in the age range under forty, while above that age, most of the respondents were men; this fact this disparity was greater in the over 61 year old group where 65.5% were men.

These university teachers were from various fields of knowledge: 38.4% were from social sciences, 21.4% were from science, 16.5% engineering and 11.6% health sciences while 11.2% were in the field of humanities. Regarding the professional category of these professors, 43.5% were tenured lecturers, 16.2% were contracted PhDs and 12.5% were tenured professors. Pre-doctorate interns, associate professors and substitute professors accounted for 14.4%. Lastly, regarding the universities where the various faculty members responding to the inventory worked, 27.3% were from the University of Seville, 24.9% from the Universidad of Granada, 9.6% from the University of Cadiz, 7.5% from the University of Huelva, 7.2% from the Universidad of Jaen, 6.9% from the University of Almeria and 6.8% from the University of Cordoba. Lesser percentages corresponded to those at the Pablo de Olavide University with 4.4%, the University of Malaga with 3.8% and 1.7% at the University of Loyola.

3. Results

The means obtained for each of the items in the inventory, as shown on Table 1, offer a usage profile of learning with technologies by Andalusian university lecturers, which could be catalogued as «teaching with limited integration of ICTs». The highest values, in mean terms, are those that hardly alternate their «traditional» teaching with technologies, those in which technologies are used for learning activities focusing on the instructor or those that allow limited student participation. Moreover, these are items that are implemented because they offer a basic level of difficulty. On the other hand, items with a very low mean value refer to activities in which the technology used is very advanced and specific; for sample, augmented reality or remote laboratories.

To analyze the various usage levels of the learning activities with technologies, we proceeded to calculate a mean of the general usage per participant according to the scores given for each of the various items of the inventory. Then we sought ranges using the visual grouping option provided by SPSS software. We established the grouping option using midpoint cutoffs and standard deviation +-1, based on the cases explored. With this, four groups were obtained, which allowed us to classify the instructors according the frequency that they used technology in learning activities.

The first of these groups includes lecturers who surpass the 3.694 points for mean general usage; in other words, these made very frequent use of technology in their learning activities. Table 1 shows the items that reached a greater mean level of usage in this group of lecturers.

16.7% of the respondents to the inventory were included in the elevated usage of technology group; this corresponded to 157 participants. These were either men (50.3%) or women (49.7%); most of these (105 people or 66.8%) were between the ages of 31 and 50. Furthermore, higher usage was seen among professors of Education (31.6%), followed by those in the field of Science (14.8%).

It is noteworthy that on the list of learning activities for which these instructors used technology, there were a variety of possibilities. Although the so called assimilative activities (technology as support for the lecturer's presentation) were used more frequently, we also found learning activities based on communication, information management, application as well as evaluative and productive. It could therefore be said that lecturers who used digital technology intensively, did so for a variety of learning activities for their students.

The second group of lecturers was those whose mean of general use of activities with technologies was between 3.694 and 2.805 points; these were titled average usage. This group constitutes 25.3% of the professors, 238 participants). Of these, 52.5% were men and 46.6% were women. 45% were between 41 and 50 years of age and 26.5% between 51 and 60 years of age. The average use of activities with tech-

nologies is especially outstanding among engineering lecturers (20.2%). These instructors, as shown on Table 1, frequently used technology in almost all learning activities we identified with regards to the previous group. However, there is one noteworthy difference with the previous group: limited use of technologies to develop evaluative learning activities.

Thirdly, we found that 44% of the lecturers fell

Table 1. Means and typical deviation of all items included in the inventory, and the mean scores of the items for the instructor profile with very frequent usage, medium usage, limited usage and minimal usage of technologies to design learning activities

ITEMS	Mean (Min. 1, Max. 6)	Standard Deviation	Very frequently used	Average Usage	Seldom Usage	Minimal Usage
1. Use presentations during a master class, created with some type of software.	5.47	1.10	5.75	5.63	5.49	4.79
9. Select text documents and upload them onto the virtual platform for students to read.	4.98	1.42	5.55	5.4	4.86	3.88
16. Develop online tutorials by means of various communication tools.	4.64	1.72	5.38	5.2	4.39	
6. Provide videos, demonstrations and simulations on the virtual platform.	4.38	1.73	5.31	5.13	4.08	
29. Use virtual platform tools to turn in homework/papers.	4.37	1.939	5.37	5.3	4.1	
3. Show simulations, demonstrations or examples based on digital resources during a master class.	4.23	1.53	5.21		3.99	
37. Promote and encourage respect for the intellectual work of other by providing copyright and intellectual property rights laws that are applicable to academic activities.	4.16	1.94	5.21	4.82	3.89	
10. Teach students to verify the truth behind the information sought out on the Internet.	3.93	1.84	5.15	4.78		
4. Use video segments taken from Internet during a master class.	3.72	1.77	4.99	4.36		
13. Design case-studies using digital resources so that students can apply the theory learned to practical cases.	3.64	2.01	4.76	4.56		
19. Organize activities in which some type of digital material must be produced.	3.60	1.94	4.88	4.24		
23. Promote creative presentation of papers using infographics, presentations…	3.20	2.05	4.53	4		
22. Propose complex problem solving activities using digital resources.	3.05	1.95	4.22			
12. Design quantitative or qualitative data analysis activities using specific software.	2.87	2.02				
32. Provide online, self-assessment exercises.	2.75	2.02	4.03			
15. Promote collaborative work using tools such as wikis, Google Drive, Dropbox, etc.	2.70	1.95	4.38	3.71		
38. Attend the terms of use for digital material with a Creative Commons license.	2.69	2.1	3.82			
14. Manage debates by means of online discussion forums	2.64	1.87	4.35			
28. Use online headings for assessment.	2.60	2.03	4.22			
31. Draft exams on the virtual platform.	2.46	1.93				
36. Evaluate the quality of interventions in forums, emails, chats, blogs, etc.	2.41	1.88	3.85			
35. Use anti-plagiarism software when assessing papers.	2.22	1.84				
27. Offer online courses, conferences and other open academic activities on the virtual platform.	2.15	1.71				
30. Use electronic portfolio for assessment. .	2.09	1.83				
18. Design activities in which students must provide comments by means of personal or group blogs.	1,96	1,64				
21. Distribute news, information, current events, etc. through social networks.	1.96	1.73				
26. Design simulated professional situations, whether virtual simulators or reproduced scenarios.	1.83	1.6				
20. Request reports, essays, articles, etc. using appointment management tools.	1.82	1.59		3.92		
17. Facilitate interaction outside the classroom by means of cell phone-based apps.	1.80	1.66				
7. Using a virtual platform, facilitate video or audio recordings made by the actual teacher.	1.77	1.61				
11. Use conceptual maps.	1.62	1.44				
8. Design online contents with authoring tools for his/her lecture.	1.58	1.36				
5. Use videoconference or webminar to present expositions by the actual teacher or other experts.	1.49	1.2				
2. Use an Interactive Whiteboard during a lecture/master class	1.38	1.04				
24. Design leaning activities using augmented reality.	1.27	0.95				
25. Organize practical practice session using remote labs.	1.16	0.75				
33. Undertake classroom surveys using cell-phone applications.	1.13	0.75				
34. Undertake classroom surveys using the interactive, white-board remote.	1.12	0.69				

within a range titled as seldom use technology as a teaching support. This category included the largest number of lecturers, with 418 respondents, of which 50.7% were and 49.3% women. 73.4% were between 41 and 60 years of age.

This group of instructors only rarely uses technology, and the type that they use –as shown on table 1– is even more limited. These include multimedia presentations to support master class expositions, email and other communication tools to attend students and a virtual platform to provide texts, videos and other support resources. Students could also access learning tasks using these same resources.

Lecturers whose average scores for general usage was lower than 1.916 made up the fourth group. These corresponded to minimal usage of technology in the teaching-learning process and grouped together 13.6% of the respondents. For the most part, this profile appeared among science lecturers (31%). In this case, the instructors only used two types of leaning activities with technology more frequently: they used presentations created with some type of software during a master's class and selected text documents and made them available on the virtual platform for reading.

Of these lecturers, 59.8% were men and 69.5% fell within the 41-60 year age group. Lastly, if the four usage profiles were reduced to two, these would be medium-high and low. We found that lecturers from the field of law, labor science and science in general, tended to fall within the lowest profile identified, with 73.6% and 69%, respectively.

4. Discussion and conclusions

The results presented contribute to the debate between stability and change in teachers' beliefs, attitudes towards and knowledge of technology and its uses in the classroom. Research that has been undertaken to date about the process of change among teachers (with or without technologies) draws attention to the need to learn implicit theories and practical knowledge which teachers have when it comes to explaining why some changes are accepted with ease while others are not. Processes of change in teachers, motivated by technology, show that instructors are oriented toward change within stability. That is to say, they introduce those technologies that are coherent with their teaching methodology, specifically with those activities they usually carry out. This principle of coherence is backed by the results of this research. We found that instructors intensively use those technologies that support teaching and learning strategies in which the main player is the content and its transmission using various media (audio, video, documents and demonstrations).

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This result confirms the idea that among lecturers, change does not take place by simply placing them in contact with technology. In other words, technology alone does not change the learning environment. It requires a more intense intervention in which technology accompanies teaching and learning strategies that not only prioritize the acquisition of knowledge based on digital resources, but that are based on the appropriation processing of this knowledge by students through productive, experiential or communicative learning activities (Marcelo, Yot & Mayor, 2011).

Thus, the predominance of assimilative learning activities is commonplace among all instructors, independent of their age or technological usage level. Only

with those lecturers who use technology frequently or very frequently do we see learning activities that favor the implementation of what students have learned by solving problems or cases, peer collaboration for team tasks or a more authentic assessment with self-evaluation exercises or headings. Nevertheless, even in the teaching-learning practice of these instructors, there is limited presence of learning activities based on 2.0 technology (Hamid, Chang & Kurnia, 2009) even when students are willing to use them (Roblyer, McDaniel, Webb, Herman & Witty, 2010), and at the same time, other technologies, mentioned in the Horizon report, as in the case of emerging resources such as cell phone applications (Cochrane & Bateman, 2009) or more experiential technologies such as augmented reality, also remain unused.

In this research, we found that there were various groups of instructors with regards to the digital technology usage level in the design of their teaching. The fact remains that there is a significant group (16.7%) of lecturers who have been able to integrate technology as a support to develop a more ample variety of learning activities for their students. Lecturers have promoted changes in their teaching practice and no doubt, in their knowledge and beliefs. More specific studies would require a more detailed analysis of these instructors to learn how these processes have taken place and what measures have influenced the intrinsic (motivation, perception of self-efficiency) or extrinsic variables. Likewise, it would also require an in depth study about why we failed to find –as it would have been expected– a more intensive usage of digital technologies amongst younger lecturers. There seems to be a difference in the usage of technology for personal communication and learning and the use of these same resources in the professional and teaching sphere.

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Mexican Children and American Cartoons: Foreign References in Animation

Niños mexicanos y dibujos animados norteamericanos: referencias extranjeras en series animadas

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ABSTRACT

This audience study explores how a group of children from Southeast Mexico, perceive the animated cartoon «Dexter's Laboratory». The objective is to observe the ways in which a young local audience, still in the process of building its cultural identity, perceives an American television program. A qualitative approach was applied: 44 children between 8 and 11 years old participated in a series of semi-structured interviews and focus groups, which took place in a provincial city in Mexico (Villahermosa, Tabasco). In each session, the participants watched an episode of the cartoon dubbed into Latin Spanish. Afterwards, it was assessed if they were able to notice cultural elements present in the series (texts in English, traditions, ways of life, symbols, etc.), which are different from their own culture. It was also observed if age, gender and social background had any impact on the degree of awareness. The results showed that most of the participants were aware of the fact that they were watching a foreign program, that they could recognize elements of American culture and that they applied diverse strategies to make sense of these foreign narratives. Older children, and those studying English as a second language, were able to make more sophisticated comparisons between the cultures of Mexico and the United States.

RESUMEN

Este estudio sobre audiencias explora cómo un grupo de niños del sureste de México perciben los dibujos animados de «El laboratorio de Dexter». El objetivo primordial es conocer la manera en que un programa norteamericano distribuido internacionalmente es entendido por una audiencia local, especialmente por una conformada por individuos que aún están construyendo su identidad cultural. Se utilizó un enfoque cualitativo: un total de 44 niños en edades entre los 8 y 11 años participaron en una serie de entrevistas semi-estructuradas y grupos de discusión, que se llevaron a cabo en una ciudad de la provincia mexicana (Villahermosa, Tabasco). En cada sesión se observó un episodio de la serie animada doblada al español latino. Posteriormente, se evaluó si los participantes sabían que los dibujos animados eran norteamericanos y si notaban la presencia de elementos culturales diferentes respecto a su propia cultura (textos escritos en inglés, referencias a tradiciones, estilo de vida, símbolos, etc.). Asimismo, se indagó si la edad, el género y estrato social de proveniencia influían en esta percepción. Los resultados muestran que la mayoría de los participantes eran conscientes de estar viendo un programa extranjero, reconocían elementos de la cultura norteamericana y aplicaban diversas estrategias para crear sentido a estas narrativas. Niños mayores, y aquellos que estudian el idioma inglés, fueron capaces de realizar comparaciones más sofisticadas entre las culturas de México y Estados Unidos.

KEYWORDS | PALABRAS CLAVE

Television studies, audience studies, intercultural communication, animation, american cartoons, children audience.
Estudios de televisión, estudios de audiencias, comunicación intercultural, animación, dibujos animados norteamericanos, público infantil.

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1. Introduction and background

Animation is one of the most expensive and difficult to produce television genres. Hence, only a few countries in the world have the expertise to create it, while the rest have to import it (Martell, 2011). Among the countries producing animation, the most salient are the United States of America and Japan, which have developed two important traditions: animated «cartoons» and «anime» (Napier, 2001). As a consequence, the majority of the animated series available worldwide reflect the ways of life, traditions and values of these two countries.

As a technique of audio-visual creation, animation can tell any kind of story (horror, romance, pornography, suspense, action, etc.), and thus, it can reach audiences of any age. However, traditionally the youngest viewers have been the most attracted to animated cartoons, especially comedy or adventures, to the point that they prefer them above any other kind of television program.

In Mexico, where production of animation is scarce, the majority of the animated series broadcasted on television are imports. In fact, animation is one of the genres, along with films and fiction series, for which there is a strong American dominance (Lozano, 2008). This means that Mexican children devote a good part of their leisure time to watching these animated cartoons, which show different realities from the ones they experience in their daily life. The first example of such differences that comes to mind is the representation of the scholastic routines of the animated characters: these attend schools that not only look different (with long corridors lined up with lockers in the case of American cartoons), but which also show different social routines (in anime, pupils change their regular shoes for slippers when they enter the classrooms).

Two questions emerge from observing this situation: a) are children able to identify that they are watching a program created in another culture? and b) which strategies do they use to deal with the foreign cultural references they find in the program?

Their popularity among children and the fact that the market is dominated by two nations, make animated series a unique case for studying how local audiences perceive television messages of international reach.

All television programs, when imported, have to pass a «localisation» process (Chalaby, 2002) to make them more understandable and likeable for the new audiences. Still, this does not mean that the programs will lose all of their cultural specificity, since they contain references to the lifestyle, landscapes, values, humour, traditions and even stereotypes of the country of origin.

Generally, animated series are adapted through dubbing, which implies the substitution of the original soundtrack for a new one in the target language (Kilborn, 1993). Besides the dialogues, we often find that dubbing also applies to songs and to the written signs that appear in the program. The most elaborated dubbing examples are achievements in translation, since they can include local accents, traditional sayings, popular expressions and even references to famous characters from the importing country (Cobos, 2010). But even such elaborated dubbing cannot change the visuals or the story of the programs. Within these translation gaps, specific cultural references remain, which the young viewers have to deal with if they are to make sense of the narrative.

Hence, it is relevant to ask how children perceive imported animated series. First, in order to know whether they can identify these cartoons as something different from their own culture and second, to explore how they make sense of the foreign cultural references found in these programs.

The review of the literature reveals that there is a scarcity of empirical research on the understanding that children have of animated programs of foreign origin. In particular, little is known about the strategies that they use to understand animated cartoons that have been adapted through dubbing.

Although the complex relationship between children and television has been amply studied from a variety of perspectives, there are just a few research works that have directly studied the way in which children understand foreign animated cartoons (among others, Corona, 1989; Charles, 1989; Moran & Chung, 2003; Amaral, 2005; Donald, 2005). In this sense, this work aims to contribute to a field of research that is still under development.

The main objective of this study is to ascertain if a group of Mexican children between the ages of 8 and 11 are able to identify that the animated cartoons they watch are foreign. A second goal is to identify the mechanisms these young members of the audience use to understand the references to American culture that appear in the series «Dexter's Laboratory» (produced by Cartoon Network). Finally, the third objective is to evaluate if this understanding could be affected by factors such as age, gender or social class. The publication of these results is pertinent because of the prevalence of the assumptions that originated the research: a) the Japanese and American dominance in the Mexican market for animation, b) the preference that children in these age groups show for animated cartoons, and c) the limitations of dubbing in order to

adapt the cultural references included in the programs. Thus, the specific relationship that becomes established between the American cartoons and Mexican children continues to exist, with the mediating action of dubbing.

2. Research methods

As it has been explained before, the objective was to explore how a group of children from a provincial city in Southeast Mexico understood American animated cartoons that have been translated through dubbing. Specifically, the aim was to observe whether the participants were able to recognise that the series was foreign, and to identify which were the mechanisms they put at play to make sense of media products created outside of their own culture.

For the empirical work, a qualitative approach was chosen, following the main tradition of international studies on television audiences (Ang, 1985; Liebes & Katz, 1990; Kraidy, 1999; Pertierra, 2012). Qualitative techniques, such as semi-structured interviews and focus groups, do not limit the respondents to a pre-determined set of answers, but can nevertheless offer a clear vision of the situation in which these children watch television.

Therefore, the results obtained in this manner should not be generalized to the whole population, but should be understood as insights about the meanings that a specific community is creating out of a given cultural product. In this particular case, they would make it possible to obtain a clearer idea about the ways in which these children perceive the cultural references that remain in this American animated series, even after dubbing.

The fieldwork consisted of six sessions of semi-structured interviews and six focus groups, which took place during the months of December 2004 and January 2005 in the city of Villahermosa, Tabasco, Mexico. The interviews were conducted in the children's homes, which allowed for the observation of the daily context where the social practice of television viewing took place. Half of the focus groups' sessions took place in a public elementary school, while the other half took place in a private one. In Mexico, the type of school a child attends marks in a clear way the belonging to a given social class due to the high cost of tuition in private institutions.

A total of 44 children participated in the research project: 7 of them in the interviews (a pair of twin girls took part in a single session) and 37 in the focus groups. Plenty of attention was given in order to ensure that the groups were equally divided by age and gender. Likewise, we sought participants that belonged to a variety of social strata, which in a certain way was determined by their attendance to public or private schools (Tables 1 and 2). An exact proportion was not achieved in every case, but the qualitative outlook of the study allowed for a certain amount of flexibility in this regard.

The age of the participants was within the range of 8 to 11 because these children are already capable of clearly understanding the narrative codes of television (Josephson, 1995; Anderson, 2004). Also, working with children this age ensures that all of them are able to read the written texts that usually appear in animated cartoons, as those signs cannot always be translated and remain in the original language.

In the case of the interviews, due to the difficulty of obtaining access to the homes of young children to carry on observations, the participants were recruited

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through acquaintances and relatives of the researcher. The participants in the focus groups volunteered at their schools. In every case, the researcher obtained consent from the children as well as informed consent signed by the parents. Pseudonyms were used to ensure confidentiality.

Table 1. Distribution of participants in the interview sessions

PARTICIPANTS	AGE	GENDER	TYPE OF SCHOOL
Alicia and Andrea	9 years old	Girls (twins)	Public
Karina	9 years old	Girl	Private
Diana	11 years old	Girl	Public
Hernán	9 years old	Boy	Private
Ángel	8 years old	Boy	Public
Lucas	8 years old	Boy	Private
7 participants in total	2 children age 8, 4 children age 9, and one child age 11	4 girls/3 boys	4 public/3 private

The animated series «Dexter's Laboratory» was selected as the case study because of three main reasons: a) at the time, the series was available in Mexico both on over the air and paid television; b) it was dubbed in Latin American Spanish; c) it was very popular among the young Mexican television viewers (IBOPE, 2005). All of these characteristics made it accessible for the children who participated in the study, without distinction of age, gender or social class. An important additional reason was that the series, being set in contemporary United States, displayed the lifestyle of a typical American family.

The series tells the story of a boy genius named Dexter and of his sister DeeDee, who live with their parents in a house in the suburbs. There is a strong element of fantasy and science fiction in the narrative but there are also typical situations that show American culture. Besides Dexter's adventures, there are also short stories of a group of superheroes led by Major Glory (Mayor America in Spanish) in the series. The presence of all these elements was crucial to enable the discussion about aspects related to cultural differences.

Each of the interview sessions and discussion groups was divided into three parts: for the first 20 minutes the children watched an episode from the animated series, which had been recently recorded from the daily television broadcast. The viewing phase allowed the researcher to observe the reactions of the children while watching the program, as well as to gather spontaneous comments. Afterwards, the participants were asked to tell the main story of the episode. The discussion that followed was structured in a flexible way around a series of topics: it started by asking the participants their opinion about the series, then they were asked where they thought the character lived and where the series was produced; they were also asked to compare their own life with the life of the protagonist, and then slowly the discussion moved to questions concerning the American cultural references contained in the episodes, such as written signs in English, locales and places typical of the American cities, monuments, symbols, etc.

Both the focus groups and the interviews were videotaped and field notes were taken. The interviews were transcribed in full. Transcription of the focus groups was partial, due to the large amount of data and the level of overlap of the participants' interventions. However, the video recordings from these sessions were carefully analysed in order to take into account the answers in the most faithful manner possible.

The information obtained from the fieldwork was codified according to categories of analysis. Since the interest of the study was very specific, some of the categories had been established a priori and were already included in the guide of topics used to structure the sessions (e.g. understanding of the narrative, identification of the origin of animated cartoons, comparison between the life of the character and their own life, etc.). Other categories emerged directly from the answers that children offered, as well as from the field notes (e.g. violent cartoons, negotiation of foreign content through local referents, awareness of dubbing conventions, etc.).

Table 2. Distribution of the participants in the focus groups

FOCUS GROUP	AGE	COMPOSITION BY GENDER	TYPE OF SCHOOL
1	8 years old	3 girls/3 boys	Public
2	9 years old	1 girl/4 boys	Public
3	10 years old	4 girls/3 boys	Public
4	8 years old	3 girls/3 boys	Private
5	9 years old	4 girls/3 boys	Private
6	10 years old	3 girls/3 boys	Private
37 participants in total	12 children age 8, 12 children age 9, and 13 children age 10	18 girls/19 boys	18 public/19 private

3. Analysis and results

The first result derived from the fieldwork is that all the participants were able to understand and correctly tell the basic story of the episode. In this sense, there were no visible differences in terms of age, gender or social class of the respondents. The participants showed a good understanding of humour as well, which is one of the elements that is regularly lost or diminished in translation. This could be explained in part because a high percentage of comedy in cartoons is visual.

When their opinion on animated cartoons was asked, children mentioned the parts that they liked and those they disliked the most. From this question, it became clear that a majority of the participants were already acquainted with the characters and the basic themes in the series. Not only did they remember the main argument and specific moments of the episode, but they also mentioned many other scenes, characters and recurrent jokes in the series, which they had seen on their own televisions. Hence, the availability of «Dexter's Laboratory» to its audience was confirmed, as well as the popularity of animated cartoons in general, since the participants also named many other titles of both American and Japanese origins.

Immediately afterwards, the children compared what the saw in the animated cartoons with what they experienced in their own lives. Mostly, they focused on tangible things that surrounded them, such as the shape of the houses they saw in the series and their own houses. Many other children also compared the protagonist's family with their own family, talking about the anatomy of the characters, the parents' occupation and sibling rivalry. In this sense, age seems to be a determinant factor as 10-year-old children, from both the public and private schools, made more sophisticated comparisons. In fact, the 10-year-old participants of the focus group from the private school talked about Mexican and American lifestyles. After they had agreed that Dexter lived in the United States, they were asked how they knew this.

The answer came from two boys (Calvin and Armando) and a girl (Ari): «Calvin: Because of the American lifestyle; Researcher: How is the American lifestyle? Calvin: Well, a house with their family, only for themselves; Armando: And also they are always two-storey houses; Calvin: Yes, and a school with lockers, which are very rare here in Mexico; Armando: And that they go [to school] with everyday clothes; Calvin: With pants, everyday clothes, yes; Ari: And the public schools [in the United States] are like the private ones [in Mexico], only that the private ones [in the United States] are much more expensive.» In this dialogue, the participants show they are able to compare elements of their daily life with what they watch onscreen, even in the case of a genre like animation, which could be considered incredible.

The next category of analysis was the place where Dexter lived. Most of the children, both in the interviews and the focus groups, responded that the character lived in the United States. They said that they had reached this conclusion because they had seen the character Major Glory, a superhero that wears the American flag as his uniform. The 10-year-old children in the focus groups, both in the public and private schools, were so sure that Dexter lived in the United States that they even tried guessing the exact setting of the series, saying that it could be Washington or New York City. On the other hand, a minority of children (one 8-year-old boy from the public school, five 9-year-olds from the public school and one 9-year-old boy from the private school) said that Dexter lived in the capital of their own country, that is, in Mexico City. As the reason for this conclusion, one of them mentioned that it was «because most of the characters [on television] live there». Somehow, the children, from a provincial city, see the capital as the centre of many things in the country, and particularly for television production.

When the participants were asked if they knew where the series «Dexter's Laboratory» was produced, once again the older children in general, and those that attended the private school in particular, were able to say that the program was produced in the United States. Among the reasons they mentioned to reach such conclusions were: a) the opening title and the closing credits of the program are in English; b) Major Glory's uniform displays the American flag; c) they had seen a special program about the production of the series on the cable/satellite channel Cartoon Network. One 8-year-old from the public school mentioned that he was sure the program was made in the United States because he had read it on the Internet. Similarly, a 9-year-old from the private school specified that it was produced in the United States «but it is translated here [in Mexico] ». Only the 9-year-old children group from the public school said that the series was produced in Mexico City, but they did not offer any reasons to justify this idea.

Following the logic of the previous question, the children discussed how it was possible to recognize the origins of animated cartoons. The participants coming from all social classes and ages were accurate in describing the differences between American and

Japanese animated series, even from an aesthetic point of view (they said, for example, that the characters in Japanese programs have huge bright eyes). Interestingly, mirroring a common opinion among parents at the time, some children said that Japanese cartoons could be recognized because they were violent (this was clearly expressed by a 10-year-old boy from the private school: «The most bloody ones come from Japan, such as «Jackie Chan», «Dragon Ball Z», «The Ninja Turtles»). Likewise, a couple of children said that the written signs that appear in the programs are good indicators of the cartoon's origin.

At this point, the children were asked to explain what they usually do when they see written signs in English in the animated cartoons. Most of them, without distinction in age or social origin, said that when they see a sign that is written in another language, they wait for a voice to «announce» what it means (this would be a dubbing convention). A minority of the participants, all of them from the private school, explained that they read the written texts because they could already understand their meaning in English, for they study the language as a mandatory subject at school. Elementary public schools in Mexico, on the other hand, do not offer teaching of the English language. However, the twin girls interviewed (9-years-old), who attended a public school, said that when they see an unknown word in the title of a cartoon they look for the meaning in the bilingual dictionary. Another 8-year-old boy from the public school explained that regarding the signs written in English, he would ask his father: «I never understand a thing. I ask my dad: what does that mean? And he does not understand a thing either. The one who understands is my uncle, because he knows English…». All of these seem to be common mechanisms among these children to try to understand the foreign cultural references.

Besides the participants' answers, it was also possible to take note of their reactions while they watched the episode. From there came the observation that they understand the narrative in a quite adequate way. 10-year-old participants from the private school even recognized the image of Albert Einstein in one of the shorts.

Also, there was a curious moment of negotiation of meanings, when the 9-year-old boy interviewed (private school), seeing the image of a cowboy riding in a black and white scene, identified him with the Mexican «revolucionario» Emiliano Zapata. Thus, he used a local reference to make sense of something that came from outside his own culture.

4. Discussion and conclusions

Observing these children watching television confirmed what had theoretically been sustained, in the sense that these are viewers that created meanings socially-within their interpretive communities (Orozco, 1990; 1994; Seiter, 1998): while they were watching the episodes recorded for the sessions they commented with their peers, brothers or sisters, made observations, criticized, and asked about what they could not understand.

Complementary, these children were not only an active audience in an ideological sense, as Stuart Hall understood it (2001), but also an audience that was physically active while watching television (Palmer, 1986). During the interviews at their homes, they would entertain themselves in different activities while watching television, such as playing with their toys, eating candy, hugging their stuffed animals, finding the best spot on their beds or sofas, or even teasing their siblings. Also, it was observed that these children had clear categories for what is good and bad, realistic or not realistic in television programs and that they knew what to expect from different genres. In fact, it was possible to infer from their answers that they had specialized knowledge about animated cartoons, which constitute an important part of their daily cultural consumption, along with videogames, films, comic books, etc. (Kinder, 1991).

In regard to the specific focus of this work, all of the participants were able to follow the narrative of the American animated cartoons and they were able to understand the humour. There were not differences related to gender, since both girls and boys showed equal understanding. Age, on the other hand, seemed to be an influential factor, for older children made more sophisticated comparisons regarding their own lives and the elements they watched on the program. Also, children attending the private school were able to talk in a more abstract manner about Mexican and American lifestyles. The facts that these children were more familiar with the English language and that many of them had travelled abroad seemed to play a relevant role in this respect.

Regarding the notions they had about the places portrayed in the animated cartoons, and the place of production of the show, the participants as a group still expressed a certain level of ambiguity. For some of them, Mexico City, as a different and far removed place from their province, was an important point of reference. In fact, it was obvious that for older children and for those belonging to a higher social class, it was clearer that the program was specifically

American. They recognized the origin because of the title and credit sequences in English, as well as for some specifically American cultural traits of the characters.

The discussion on the ways these children recognized the origin of animated cartoons was very revealing, since they precisely described the aesthetic features of Japanese anime, and even expressed some of their judgements about it, such as the fact that it was considered violent.

Finally, it was possible to identify some of the mechanisms that these children applied for the understanding of the cultural references coming from outside their own culture, above all the signs written in English that could not be modified or deleted from the visuals. At this point, the efficacy of dubbing as an adaptation method was confirmed, because all of the children interviewed knew that by convention a masculine voice («a man») must read out loud in Spanish what is written in English. This implies that from a very young age, these children are already aware that some television contents are translated. Nevertheless, regarding the interpretation of these written texts, there was a noticeable difference between younger and older children, because the older reported that they made the effort to ask their parents about the meaning of the words, or even directly searched for them in a bilingual dictionary. At the social class level, the children from the private school had an advantage, for they knew the English language, some of them had been in the United States, or they had relatives who lived in that country. All of this provided them with better first hand-knowledge of the American lifestyle. At this point, my interpretation coincides with the one proposed by La Pastina and Straubhaar (2005) regarding the perception of telenovelas in Brazil: cultural capital (Bourdieu, 1984) seems to be a relevant factor that guides the interpretation of media narratives, even at ages so early as the range studied here.

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The implications of these results can neither be generalized to all Mexican children nor to all children from the same region where the study was conducted, due to the use of qualitative methods. In spite of that, many of the comments and observations show that these children are conscious about watching a message coming from a different culture. Apparently, the ability of the participants to differentiate their own reality from the one presented in a television program matures with age and is also related to cultural capital. The participants from the private school had a higher possibility of developing, from earlier on, a more complex conception of the world by learning English, through access to international channels on pay television and even by travelling to the United States, where they had personally seen the culture portrayed in American cartoons.

Television messages contribute to children's education by showing them portrayals of the world; as a result, it is important to endorse the active consumption of television by children. In this study, although limited in scope but nevertheless clarifying, children appeared as curious and conscious television viewers. They revealed themselves as subjects that built their cultural identity from a multiplicity of stimuli (local, national and global), to which they had access to according to the socio-economic conditions in which they lived in. A new series of empirical observations would surely enrich the understanding of this pheno-

menon, especially if we take into account that children are adopting new technologies such as smartphones and tablets, which are privileged access points to local and foreign cultural referents.

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ICT Leadership in Higher Education: A Multiple Case Study in Colombia

Liderazgo de las TIC en educación superior: estudio de caso múltiple en Colombia

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ABSTRACT

In this paper we analyze ICT integration in higher education institutions focusing on the leadership practices of ICT policies, a research field that has not received much attention in higher education studies. An empirical study was carried out using a distributed leadership approach to analyze such practice in higher education institutions in Colombia, a country where a national ICT policy has steered and promoted ICT policy plans. In particular, the inquiry attempted to understand how the leadership of ICT is distributed in different higher education environments. Through a multiple case study, that included semi-structured interviews with leaders and team members, focus groups with professors, document analysis and a survey applied to faculty members ICT leadership practices and their implications were investigated. The results indicate a set of struggles that leaders have to cope with when deploying an ICT policy plan, for instance, coping with a lack of institutional regulations, and fostering educational change despite reluctance. Indeed, ICT leadership is a challenging and underexplored practice in higher education. This paper is a systematic attempt to demonstrate this statement and its implications. These findings are of particular relevance for the work of policy makers, ICT coordinators and leaders in higher education around the world.

RESUMEN

En este artículo analizamos la integración de las TIC en instituciones de educación superior. Nos centramos en las prácticas de liderazgo en políticas sobre TIC, un campo de investigación que no ha recibido mucha atención en los estudios sobre educación superior. Usando un enfoque de liderazgo distribuido se analizó dicha práctica en instituciones de educación superior en Colombia, un país donde una política de incorporación de las TIC llevó a promover la elaboración de planes estratégicos en dichas instituciones. En particular, la investigación buscó entender cómo el liderazgo de las TIC es distribuido en diferentes ambientes de educación superior. A partir de un estudio de caso múltiple que incluyó entrevistas semiestructuradas con líderes y miembros de equipos, grupos focales con profesores, análisis documental y una encuesta aplicada a profesores, fueron investigadas las prácticas de liderazgo de las TIC y sus implicaciones. Los resultados indican un conjunto de tensiones que los líderes deben enfrentar cuando incorporan un plan estratégico de TIC, por ejemplo, la ausencia de regulaciones institucionales o la necesidad de promocionar el cambio educativo a pesar de las resistencias. De hecho, el liderazgo de las TIC es una práctica retadora y aún poco explorada en educación superior. Este artículo es un intento sistemático por demostrar este enunciado y sus implicaciones. Estos hallazgos son de particular relevancia para el trabajo de los diseñadores de políticas, coordinadores de TIC y líderes en educación superior de todo el mundo.

KEYWORDS | PALABRAS CLAVE

Higher education, leadership, ICT policies, distributed leadership, educational policy, educational planning, case study.
Educación superior, liderazgo, políticas TIC, liderazgo distribuido, política educativa, planeación educativa, estudio de caso.

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1. Introduction

Within the field of ICT integration in education, one research tradition focuses on the conditions that support ICT use for teaching and learning (Vanderlinde & Van-Braak, 2010). Within this stream, one of the conditions that has only recently received attention is situated at the organizational level, more specifically in what is called the ICT policy planning, referred to as «having a shared vision on technology integration and an ICT policy plan» (Hew & Brush, 2007). The general assumption and common agreement is that ICT policy plans increase the success of ICT integration in educational contexts (Bates, 2001; Wang & Woo, 2007; Gulbahar, 2007). At the national, district or institutional level, ICT policy plans are conceived as a blueprint of what education should look like through the use of ICT (Fishman & Zhang, 2003). Furthermore, such an ICT policy plans outlines learning objectives for the use of ICT, making this process a strategic device and potentially a driver for educational change (Vanderlinde, Van-Braak & Dexter, 2012).

In this paper, we inquire how leadership of ICT is distributed in different higher education environments, highlighting the sorts of problems that emerge in such activity. As we will argue in the next section, the analysis of ICT leadership from a distributed leadership approach is an appropriate perspective from which to study the challenging nature of ICT leadership in higher education. In order to understand how leadership is displayed in higher education institutions (HEI hereinafter) in which ICT policy plans are enacted, we use a distributed leadership perspective as the main theoretical framework. Compared to traditional perspectives, this approach assumes leadership is diffused and dispersed within organizations (Parry & Bryman, 2006). Instead of focusing primarily on the appointed leader and intrinsic traits, the analysis pays attention to the activity of leadership practices and their effects.

Spillane (2006) develops the notion of distributed leadership in contrast to the traditional conception of a charismatic leader who performs tasks in an organization on the basis of individual qualities. Therefore, the unit of analysis should be the activity of leadership (not the individual) distributed through the interaction between leader and followers across situations. Spillane was not the first to develop the idea of distributed leadership practice as a unit of analysis (Gronn, 2002; Copland, 2003). However, he offers a more consistent perspective embedded in theories of learning such as activity theory (Leontiev, 1981; Wertsch, 1991) and distributed cognition (Pea, 1993).

Accordingly, this theory assumes that followers are not individuals separated from the practice of leaders, as there is a social distribution of tasks. Such interdependence of leaders, followers and their situation means that leadership activity cannot be viewed as undertaken solely by any one of them; rather, each one is a precondition for the analysis of the entire activity. Spillane (2006) emphasizes the role of actors in a socio-cultural situation working with artifacts, which represent vehicles of thoughts. These artifacts are not only devices for achieving efficiency but they also transform the nature of leadership activity. According to Spillane tools, routines and structures enact these artifacts, both defined and re-defined by leadership practice (Spillane, 2006). In our analysis the idea of policies as tools, routines and structures is relevant as we assume ICT policy plans as artifacts (Vanderlinde, Van-Braak & Dexter, 2012).

The work of Spillane has underpinned a recent perspective that emphasizes the need of institutions to have leaders guiding and supporting those artifacts through a distributed approach. Technology leadership or ICT leadership represents this process of guidance and support in educational settings (Dexter, 2011). As McLeod and Richardson (2011) state, there has been little research on leadership of technology in general, despite recent interest in studying the key role of leaders in educational institutions to enhance innovation. Although research studies demonstrate the complexity of technology leadership –highlighting the relevance of individual and institutional factors when addressing ICT integration– there has been a gap in such studies in relation to understanding how technology leaders should enact this endeavor (Dexter, 2011).

Previous research has identified factors associated with effective leadership, defining three broad categories of leadership practices: setting direction, developing people and redesigning the organization (Leithwood, Anderson & Wahlstrom, 2004; Leithwood & Jantzi, 2003, 2005). These categories have also been applied in relation to ICT leadership practice, focusing on: 1) the vision for ICT within the institution, 2) promoting ICT teacher development and instructional support, and finally, 3) providing ICT access and technical aid, supportive policies and other conditions (Dexter, Anderson & Ronnkvist, 2002; Zhao & Frank, 2003).

A lack of literature when researching ICT leadership in higher education has been claimed (Van-Ameijde, Nelson, Billsberry & Van-Meurs, 2009). Therefore, following these studies and recommendations, we aim to study how the leadership of ICT in different higher education environments is distributed, focusing on the practice of leadership, paying attention

to the artifacts, and the situations that should be considered in this unexplored context of higher education.

2. Methodological design of the research

This study was situated in Colombia, where a national ICT policy has been in place since 2007, consisting of the elaboration of guidelines to formulate and implement ICT policy plans in HEIs. Through this policy, named PlanEsTIC, more than 100 HEIs throughout the country were steered to elaborate, implement and evaluate their own plan (Osorio, Cifuentes & Rey, 2011). Although this project was not a single initiative from the government, compared to other regions in Latin America this policy developed a National ICT policy oriented on strategic planning for ICT. Therefore we consider this a relevant case to increase knowledge about ICT leadership. As Hinostroza and Labbé says: «From a regional perspective, the introduction and use of ICTs in education in Latin America is not different than in the rest of the world. Where the region differs from many developed countries is that there is very little evidence on the characteristics of policies and the extent to which they are being implemented» (Hinostroza & Labbé, 2011: 12)

> The analysis of ICT leadership from a distributed leadership approach is an appropriate perspective from which to study the challenging nature of ICT leadership in higher education. In order to understand how leadership is displayed in higher education institutions (HEI) in which ICT policy plans are enacted, we use a distributed leadership perspective as the main theoretical framework.

According to the guidelines of PlanEsTIC, a team in each HEI was selected and guided through whole process with coordination at the national level, creating leadership conditions to deliver the individual plans. Our empirical research started with an initial exploratory stage in one of the seven regions in which PlanEsTIC was conducted, focusing on seven institutions of the selected region. Within each HEI, the leader and team members were contacted for an initial interview. It was important to select HEIs that met two minimum conditions: an explicit ICT policy plan and an ICT unit established. Essentially, ICT units are the teams in charge of integrating technology in different areas within an institution. Although many HEIs around the world have a team in charge of IT support, we were looking for ICT units that fulfill one of the guidelines of PlanEsTIC, i.e., they incorporated at least three different roles composed of a technological role, a pedagogical role, and a planning or financial role.

After the implementation of PlanEsTIC, all these institutions should have had their plans and teams arranged, but we wanted to explore initially if these plans were explicitly formulated and teams were still operating. Following initial contact, it became apparent that only three institutions had appropriate conditions to study ICT leadership in relation to developing an ICT policy plan. The graph in Figure 1 shows the structure and composition of selected the cases after the exploratory stage.

To answer the research question, a mixed methods design was carried out with three case studies. More specifically, in organizational studies, it is now considered that qualitative approaches are of particular relevance in analyzing the roles of leaders and their followers (Mumford & an-Doorn, 2001). Especially case studies are illustrative for leadership processes (Bryman, 2004).

Several instruments were applied in each HEI to explore the leadership practices, taking into account that not only the team but also professors are essential in the situated analysis of such practice. In our case, professors engaged and reluctant to use ICT were contacted and a focus group was arranged covering issues in relation to the general strategy to integrate ICT in the institution, as well as their experience of teaching supported by the ICT unit. After these initial approaches, a survey was employed at each institution to measure the general perception of the staff regarding the strategy to integrate ICT in the institution and the achievements and failures of such strategy. Table 1 shows the number and type of methods applied in each HEI.

Document analysis was also part of the methodological design. The documents were predominantly ICT policy plans, official documents (such as those

relating to foundation of units) minutes from meetings, and several Excel files containing the strategic plans of units and institutions. All structured interviews, semi-structured interviews and focus groups were transcribed and coded. For the analysis of qualitative data, Atlas.ti 7 software was used. Codes were assigned to sections of each transcription.

We used two clusters of codes. The first group was related to tools, routines and structures. The second related to leadership practices, including setting of direction, staff development and the redesign of the organization. When all coding was completed, the Atlas.ti 7 program was used to capture all text segments within one specific code. These reports (Yin, 2003) were useful to obtain main themes that emerged from the qualitative data. For the survey, descriptive data were analyzed. Due to the nature of the problem and the research question, it was found irrelevant to compare or establish statistical generalizations between HEIs. Therefore, the survey was employed to complement the understanding of beliefs and attitudes among academic staff at each institution.

The research design was structured in a case study approach (Yin, 2003). We consider that these cases were a good opportunity to analyze ICT leadership under particular conditions. A first vertical analysis allowed understanding of each case using the reports from Atlas.ti 7 and a later cross-case analysis was applied. As criteria for the quality of the research design, an analytical generalization was pursued: previously developed theory was used as a template to compare empirical results (Yin, 2003).

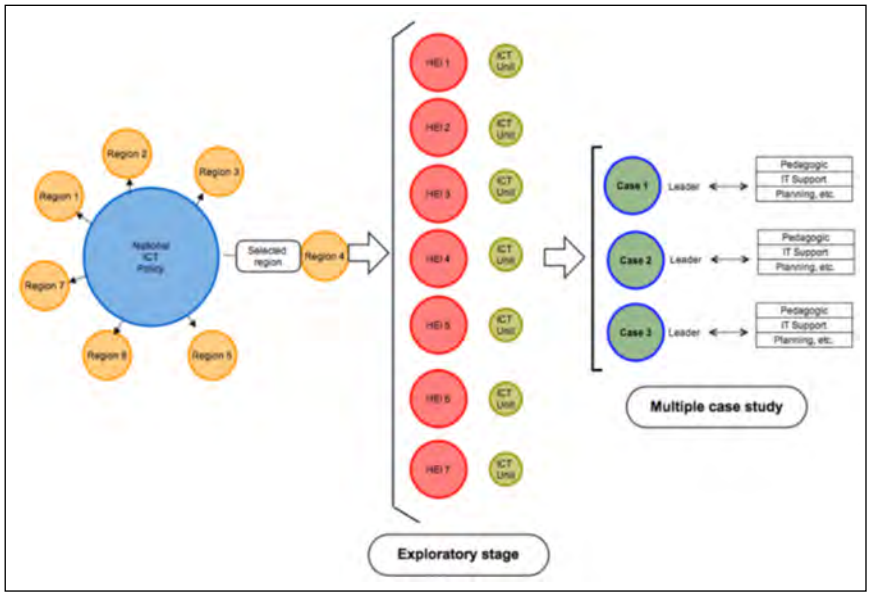

Figure 1. Structure and composition of research cases.

3. Analysis and results

Initial findings from the exploratory stage showed that institutions without an established team or a formal ICT policy plan tended to have two kinds of problems. First, when a plan exists but there is no unit in charge, efforts are pointless; and second, when a unit is appointed but there is no explicit plan to integrate technology in educational processes, there is a lack of vision, efforts cannot be guided, and strategies and activities cannot be measured in the long term. Based on this initial analysis, we selected three cases that fulfilled the conditions stated above (an explicit ICT policy plan and an ICT unit established). As we stated initially, ICT leadership is a challenging and underexplored practice in higher education. To support this argument and to answer the question regarding how the leadership of ICT is distributed in different higher education environments, we structure our findings in three sections.

First, we describe the nature of these units (structure, functions, etc.) and situate the role of artifacts through a vertical analysis of each setting. Second, through a cross-case analysis, we study the leadership activity in these contexts, using as a lens the threefold categories of leadership practice (setting direction, promoting teacher development, and redesigning organizational work) translated into ICT leadership contexts. Finally, we discuss the challenging nature of ICT leadership practice in higher education attending to certain implications for these scenarios.

3.1. Foundation and structure of each unit (within-case analysis)

We started analyzing on each setting the interdependence of leaders and followers in institutional situations in which they enacted ICT policy plans through tools, routines and structures (artifacts). As our point of departure is a deep definition of ICT policy

plans, we paid attention not only to the official documentation but also to the process of delivering and enacting it within the organization. As will be described, units were appointed to deliver an ICT policy plan within each institution. However, there were different conditions for starting such endeavor depending on institutional and organizational structures, meaning different socio-cultural situations (Spillane, 2006).

3.1.1. Case 1

In case 1, the University Council created the unit in 2008. At that time, the Minister of Education was in charge of a national project to give pedagogical support to a set of universities to implement a methodology for the development of an on-line program. From the time the university was selected to take part in the project, this ICT unit was appointed to participate; the appointed leader saw an opportunity to create a broader team within the institution to build a participatory policy on ICT (including professors and students). Therefore, in the same year, an institutional ICT policy was formulated and endorsed by the University Council. This participatory policy (bottom-up) documented needs, activities, and actors in charge; similarly indicators were delineated to achieve each activity. According to the leader, that artifact was an initial attempt to establish ICT leadership but there was a need for a more accurate strategy.

Therefore the team elaborated another artifact, called the «Virtual Strategy», to operationalize the policy to a great extent. This was an overall strategy that set out principles, a methodology and a way for the ICT unit to lead ICT integration within the institution. The process of elaboration of this artifact was built on a distributed perspective, meaning that tasks were spread among the team; even graphic design (one of the areas in the unit) was carefully considered to create an attractive and clear artifact –the Virtual Strategy– potentially known by every member of the educational community. Enhancing the previous version of the policy, this artifact defined a pedagogical model (inspired by international models), the role of teachers and students in virtual learning environments, and quality standards.

3.1.2. Case 2

The foundation of the ICT unit in this case was preceded by an institutional process of reflection on needs and opportunities in using ICT for teaching and learning. That process started 12 years ago and the unit was one of the first outcomes. Founded at that time the unit was in charge of the design of digital content and virtual learning environments. Indeed, PlanEsTIC was a later external artifact that was preceded by an institutional policy-making and ICT leadership process started in 2007. At that time, the ICT unit led to a group of professors and a research group (on educational informatics) to undertake a project on ICT integration to support academic staff. The University Council endorsed this project, linking it to the institutional strategic plan. The next year, the unit started developing the project through six strategies, including an overall diagnosis of different dimensions of ICT integration. At the end of the year, PlanEsTIC was placed as an external artifact, useful in delivering a first draft of an ICT policy plan (2009) and taking advantage of all the know-how brought by the Minister of Education.

However, as the unit leader mentioned in the interview, this external policy was not sufficient to run a formal ICT policy in the institution. Despite the knowledge transferred and organizational learning acquired, another kind of leadership was needed beyond the ICT policy plan which had been developed. Three years later, in 2012, the ICT policy plan was finally endorsed and the University Council approved the document, but only through a long and challenging process of policy-making (explained in the next section). Five strategic lines are described in this artifact: ICT diffusion, pedagogical training, pedagogi-

Table 1. Research methods: Participants, methods and objectives

Source	Method	No.	Objective according to theoretical framework
Team leader	Semi-structured interviews	3	Understand the general strategy formulated and implemented (ICT policy plan/planning). Understand leadership activity and system of practice.
Team	Structured interviews	3	Understand leadership activity (as followers)
Professors engaged with ICT	Focus groups	3	Understand perceptions and beliefs concerning ICT policy planning
Professors reluctant to use ICT	Focus groups	3	Understand perceptions and beliefs concerning ICT policy planning
Professors	Survey	N= 348	Measure overall attitudes toward the ICT policy plan administered

cal support, monitoring and assessment, and infrastructure. The overall strategy appointed a leader for each one of the strategic lines (our interviewed leader was in charge of one of them). A positive effect from this strategy was that 80% of the academic staff surveyed was aware of a formal ICT training strategy in the institution. Similarly, 58% considered that the institution offers to appropriate conditions for staff to innovate with ICTs.

3.1.3. Case 3

Four stages are described in the historical documentation of the ICT unit in this case. The first stage started in 2003, with a previous process of pedagogical training and an ICT diffusion campaign, which included the participation of the Rector, academic staff and administrative employees. The next year, the unit was founded and a second stage consisted in the formal development of several strategies -locally designed artifacts- by this unit. These strategies included research, communication, outreach services, and teaching and learning. As we could analyze in our case study reports, each of these artifacts was composed of different projects representing tasks to be enacted. For instance, one of the strategic lines (teaching and learning) drove a first training program for teachers that later became a strong and renowned program even outside the institution as an ICT training strategy for teacher development. A third stage of the ICT unit enhanced strategic lines within the university through the production of blended courses in different academic programs. In addition, at this stage, a permanent connection with the Minister of Education was established to develop projects and agreements through outreach services. The fourth stage (to date) was the consolidation of the current team, defining areas of expertise such as pedagogy, quality assessment, support system, financial management and marketing of e-learning, and design and development.

Compared to the other cases, one important feature in this ICT unit is a «shared leadership» practice. This means that since 2006, the appointed director has been sharing the coordination of the unit with another member, distributing administrative and managerial responsibilities to enhance decision-making processes. The unit has also continued to establish projects with the Minister or Education; the leaders mention that the quality of the unit is due to the level of commitment and the «high-pressure style» they are used to coping with when giving reports and detailing outcomes to the Minister. Despite this positive performance outside the institution, the leaders declare that opposition to the overall strategy from staff and other units within the institution is a common source of struggle.

3.2. How is ICT leadership distributed within the organization?

In this section we describe findings from the cross-case analysis. We focus in each category of leadership practice applied in ICT leadership contexts, i.e., setting direction, staff development and redesign of the organization (Dexter, 2011). Having considered both vertical and horizontal analyses, our findings lead to a reading of practices as a set of struggles that leaders and teams encounter in each institution.

3.2.1. Policy-making: Struggles in setting direction

As stated above, an in-depth definition of ICT policy planning highlights the process of leadership rather than the final product (document). Therefore, we paid attention to different kinds of challenges identified when analyzing ICT policy planning. One challenge is the process of development and gaining support from directors. Another is to convince Heads of Departments, coordinators, and –clearly– academic staff of the relevance of the plan. A third common struggle was the pursuit of a common vision of ICT integration within the institution. All our units of study were related to the Academic Vice-Rectory, which implied that they were in a strategic position to promote their vision. Indeed, they were all in an arena in which they could obtain support and gain a reputation that would allow them to achieve ICT integration. However, we found that followers of these units (academic staff who were enthusiastic about and engaged in ICT integration) encountered resistance from their own colleagues.

Equally, we found that levels of support for the ICT policy plan from academic staff tended not to be high among our case studies. From the staff surveyed, only in Case 2 we were able to find majority acceptance (56%), in contrast to the other cases in which favorable attitudes were held by less than 50%. In all the cases, a common feature of the practice of these leaders was a permanent struggle in the implementation of a formulated plan. For instance, promoting a shared vision also implied that leaders and their teams dealt with reluctant academic staff as part of policy-making. As claimed by one of the teams, the strong beliefs held by such staff concerning technology were a major struggle. Some of these staff members perceived the policy-making as «top-down» and «informative» (in a prescriptive sense), despite interviews with leaders mentioning a participatory process.

3.2.2. Encouraging educational change: Struggles in developing staff

As the literature states, technology leadership has to do with broader functions than technical support alone. Curriculum management and fostering educational change should be part of such an endeavor (Tondeur, Van-Keer, Van-Braak & Valcke, 2008). In our case studies, teams at each university had to struggle not only with implementing an ICT policy plan, but also trying to create conditions for innovation and educational change at different levels.

A common struggle in all the cases concerned time and this was expressed in relation to various aspects: time for academic staff training to develop ICT skills; time for academic staff to implement innovations in their courses; time for members of the unit to attain defined goals. This kind of struggle is relatively straightforward and is connected to a financial issue that intersects all ICT policies. In one of our cases the main achievements was that team members and academic staff were given time for ICT training and support activities on ICTs. However, cross-case analysis showed that this could be explained as an overlapping of different policies. Indeed, in this case, the allocation of time was possible because an administrative policy regarding funding for staff could be approved (one of the members of the team was also a member of the Administrative Council which defined the ICT policy).

As the leader mentioned, one of the most important factors in an ICT policy is the concrete allocation of time for team members and academic staff to engage with related practices, rather than a short allocation for ICT integration.

As we expected, even engaged academic staff complain of lack of time when attempting to innovate: If you want to use all that (pedagogical and technological support from the ICT unit), it requires too much time. Setting up a whole on-line course, involves you spending a lot of time, a lot, a lot (Member of academic staff, Case 1)

3.2.3. Administrative regulations: Struggles in redesigning the organization

As stated above, leadership activity is a situated practice that is constrained and framed according to possibilities and institutional conditions. Among these conditions, we also mention institutional governance as a complex web of factors such as the legislative framework, policy funding, autonomy, and market regulations (OECD, 2003). In our cases, legislative and administrative regulations regarding the payment of staff, types of recruitment (staffing), and even educational models supported by ICT (e-learning, b-learning) exert a considerable influence on ICT leadership.

> ICT units have a great responsibility and actually are key mediators for educational change, for instance, promoting new teaching practices as part of staff development. However, such activity leadership implies a permanent struggle with academic and even administrative staff. Indeed, educational change involves both pedagogical and administrative issues (legislative framework, policy funding, etc.) as a way to redesign the organization; any ICT unit should take this into consideration when enacting ICT policy plans.

According to one of the team members, in on-line modalities there is a need to clarify several economic and academic issues. For instance, there are issues concerning the hiring of staff when implementing blended and e-learning programs: what is the rate and cost of time for an on-line member of academic staff , assuming that he/she will invest more time in the beginning of the course? Similarly, rewards for enthusiastic staff members have not yet been formalized; as one staff member stated, «Those of us who have invested time deserve a reward for that extra mile we give» (Member of academic staff, Case 2)

Quality assurance is another struggle for leaders and their teams in relation to the implementation of on-line and blended modalities. One of the leaders in Case 3 described the struggle with the Administrative

Board of the institution, which demanded that on-line courses have the same number of students (40) as regular classroom courses. The leaders in this case instead defended the idea of a maximum of 30 students per course because when that number is increased «It doesn´t stimulate interaction or social knowledge construction».

4. Discussion and conclusions

In order to answer the research question, this paper has demonstrated how challenging ICT leadership is in a higher education context. To accomplish that goal, we have studied this phenomenon from a distributed leadership approach, as we consider it a powerful framework for analyzing the nature of such activity in a little-explored field. We found that formulating an ICT policy plan and establishing an ICT unit are preconditions to fostering innovation with ICTs in higher education. However, our analysis shows that further attention must be paid to policy making, steering educational change in academic staff, and dealing with administrative regulations. All these aspects constrain and frame ICT leadership practices. Concretely, using the three categories of ICT leadership (setting direction, staff development, redesign of the organization) it is possible to mention the relevance of this study for different roles involved.

For policy-makers and decision-makers at educational institutions this paper reveals the necessity of promoting ICT units envisioning them beyond IT support functions. As a matter of fact, setting direction implies not only an ICT policy plan but also a team in charge of its enactment, two prior conditions that we highlight from our initial findings.

Consequently, ICT units have a great responsibility and actually are key mediators for educational change, for instance, promoting new teaching practices as part of staff development. However, such activity leadership implies a permanent struggle with academic and even administrative staff. Indeed, educational change involves both pedagogical and administrative issues (legislative framework, policy funding, etc.) as a way to redesign the organization; any ICT unit should take this into consideration when enacting ICT policy plans.

For leaders and members of ICT units in higher education, these findings are relevant to understanding leadership as a matter of appropriate distribution of tasks depending on the ICT vision elaborated and the artifacts to hand (locally designed or received). ICT policy planning and policy-making are ongoing processes (Taylor, 1997) revealed in our cases through the persistent (and challenging) work of those teams when elaborating and redefining artifacts to increase possibilities of enacting an ICT policy plan.

Similarly, this study represents a contribution for education policy analysis in the Latin America context. Particularly the analysis of policy enactment in higher education deserves further research as we stated above, considering a deeper definition of ICT policy plans, i.e., a process more than a document to implement.

From this regional perspective, the methodological approach applied can be useful in increasing evidence based knowledge about ICT leadership in the region, since the cases illustrate the issues experienced by ICT teams that attempted to enact ICT policy plans. As literature shows, many countries in Latin America are formalizing ICT policy plans but few of them are incorporating systems for evaluating the enactment of those policies (Hinostroza & Labbé, 2011). In this regard, a possible limitation of the study is the focus on a particular region in Colombia with specific dynamics; further studies should analyze differences among regions, and even countries, on ICT policy planning. Another possible limitation is related the scope of this study on solely institutions with an ICT policy plan. Further studies should, therefore also analyze dynamics of ICT leadership when such a plan is absent.

Leadership practice and associated analytical categories have previously been conceived and tested through school-level research (Dexter, Anderson & Ronnkvist, 2002; Leithwood, Anderson & Wahlstrom, 2004; Leithwood & Jantzi, 2003, 2005; Zhao & Frank, 2003; Vanderlinde, 2010; 2013). Despite these contributions, this study outlines that when applying such framework in higher education, the high complexity of such environments deserves more attention from scholars.

Furthermore, we consider that ICT leadership in higher education should focus on different dimensions which are still under-explored, such as cultural and institutional issues. Indeed context as sociocultural situations shape differently leadership activity (Spillane, 2006). In the context of Latin America, where this study was carried out, research on ICT policy plans and leadership to enhance educational change should take this into consideration for further studies.

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Spanish Journalists and the Loss of News Quality: Professional Judgement

Los periodistas españoles y la pérdida de la calidad de la información: el juicio profesional

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ABSTRACT

This article discusses the opinions of Spanish journalists on the quality of their professional work and how it is being affected by the current economic, technological, commercial and professional context. The results are based on a questionnaire in which 363 Spanish journalists participated, all with a minimum of three years experience. Their answers reflect on the structure and behavior of media companies and current production of news. The article specifically focuses on exposing the journalists' opinions on the quality of their work. The results show that 81% of the participants state that standards of quality in journalistic production has deteriorated. This deterioration is believed to be connected to the effect of the economic struggles in the sector. They suggested that the main motives of this decline lie in the lack of economic and political independence, a lack of private investment and in the problems caused by technological changes. These situations all fall into the context of a precarious labor market within the sector. The article also links the results with academic works that have analyzed the quality of journalism over recent years. It offers, for the first time in the Spanish academic context, the Spanish journalists' own point of view on these issues.

RESUMEN

Este artículo expone los resultados de una investigación acerca del modo en el que los periodistas españoles en ejercicio enjuician la calidad periodística y cómo esta se ve afectada por el contexto económico, tecnológico, empresarial, laboral y profesional actual del periodismo. El texto recoge los resultados de una encuesta en la que participan 363 periodistas españoles con al menos tres años de experiencia en medios de comunicación. Sus respuestas aluden, entre otros aspectos, a las reflexiones acerca de la estructura y el comportamiento de las empresas informativas, así como las características predominantes de la información periodística en la actualidad. En particular, el artículo se centra en exponer las consideraciones de los periodistas acerca del cuidado o esmero de su labor profesional. Entre los principales resultados destaca que el 81% de los encuestados reconoce un empeoramiento de los patrones de calidad del producto periodístico, que ligan a la crisis del sector. Entre las posibles causas se mencionan la falta de independencia económica y política de los medios, la falta de inversión empresarial y los problemas derivados de los cambios tecnológicos, todo ello en un contexto de precarización del mercado laboral periodístico. El artículo vincula estos resultados a otros estudios internacionales que han abordado, de manera sistemática, la calidad periodística, aportando por primera vez en el contexto académico español una perspectiva de la cuestión a partir de los propios profesionales.

KEYWORDS | PALABRAS CLAVE

News quality, quality standards, journalism, professional values, journalistic ethics, crisis, technological changes, survey.
Calidad periodística, estándares de calidad, periodismo, valores profesionales, ética periodística, crisis, cambios tecnológicos, encuesta.

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1. Introduction and state of affairs

For years, traditional media have been immersed in a technological transition towards digitization that does not only affect the business models and management of media companies but also has a bearing on the manner in which they produce the information they offer their readership or audience. Recent studies on the strategies implemented by major media groups have shown that, in the long run, the push for profitability in the online versions of print media, for instance, influences fundamental factors affecting the quality of the information, even in the case of «top-end» media (Ramírez-de-la-Piscina & al., 2014).

The need to undertake an analysis of quality in journalism has generally been linked to a variety of methodological traditions and to different goals in studies undertaken on an international level (Gómez-Mompart & al., 2013). While, for the most part, research in the US has focused on the push for profitability, studies undertaken in Germany have concentrated on the issue of professionalism. Furthermore, Scandinavian countries broke new ground in Europe by basing their research on the notion of «informativeness», a notion linked to the amount of information and the space devoted by each media outlet to a series of given events. Another trend, mostly prevalent in Latin American countries –and the focus of several research studies in Spain–, has concentrated on social responsibility and democratic quality, based on the concept of journalism as a public good. Without good quality and honest journalism social well-being and democratic development are unthinkable.

In line with this research, our paper sets out to reveal the perceptions of Spanish journalists with different responsibilities and at least three years of experience concerning the quality of the content they write and present to the public, assuming that minimum standards are essential in order to guarantee robust journalistic practices serving a democratic society.

Along the same lines as the debate on quality in television (Caffarel, 2005), the growing number of proposals that have attempted to study the quality of journalism are diverse and have resulted in a body of literature that ranges from catalogues on what journalism is and should be in a democratic society to methodologies and techniques that analyze journalism in relation to news companies. In addition, these reports study the product based on professional practices, probe into the environment in which this relevant social activity is carried out and scrutinize the perception of journalism among the public (Gómez-Mompart & al., 2013).

Given the leading role that journalism plays in the field of communication, its close ties to political spheres and its impact on public opinion, establishing to what extent and in what way public information meets the requirements expected of it and considered necessary in an advanced society has led researchers and international organizations that oversee good practices to establish qualitative, and in the case of certain factors, quantitative methods when pursuing their conclusions.

In this respect, the data recording, analysis and evaluation methods employed in the design of the methodology that serves as the basis for this report are based, primarily, on the theories of gatekeeping and newsmaking. This is because, on the one hand, these theories consider the professional journalist to be a gatekeeper who is expected to guarantee good journalism as a fundamental right of citizens in open societies. On the other, the theoretical framework for this research is also based on the requirement that newsmaking responds to the criteria of newsworthiness based on values of unquestionable public interest. Furthermore, the reliability between the fact and the account thereof must fall within the basic principles of veracity, verification, contrast and honesty.

Considering the aforementioned communication theories, we have used a range of methods and techniques that draw, both explicitly and implicitly, from several sources that partly fall within different fields of knowledge, including sociology, economics, linguistics, law and political science applied to communication. The ultimate goal is to paint the picture of how the main players in providing information assess their own work and the criteria they use to assess its quality, by means of a methodology that combines a quantitative and qualitative approach to the object under study.

2. Material and methods

We have based our research on an online survey consisting of 45 questions (38 closed-ended answers and 7 open-ended answers), completed by Spanish journalists from different news outlets. When selecting the respondents, we contacted journalists currently employed by a news company who have at least three year experience in the profession, irrespective of their professional category. The survey was sent out with the help of Spanish professional journalism associations, using several in-house communication tools and social media (associations involved in the distribution of the survey included the Association of Journalists of Madrid, the Catalonian Association of Journalists, the Andalusian Federation of Press Associations, the

Andalusian Union of Journalists and the Union of Journalists of Valencia). Data was collected over the months of June and July 2013, and 363 journalists took the survey anonymously (45% women and 55% men). The criteria of being actively employed and having a proven experience of at least three years makes it difficult to establish the statistical scope of the end sample, although the 363 completed questionnaires do, in fact, support the results obtained.

The survey was designed around four main pillars: structure and behavior of the news outlet (17 closed-ended questions); processing of the information (10 questions); due care and diligence in news production (11 questions); causes and reasons behind the loss of quality (7 questions). The latter section combined closed-ended and open-ended questions so as to let respondents provide us with their insights and views when outlining their perception of quality in journalism. The focus was placed on «quality in journalism» rather than on «quality of information», given that we are attempting to analyze the professional perception of the actual journalistic output and also that of the entire information-communication process, which involves both journalists and editors or administrators in a news company.

2.1. The theoretical foundations of the survey design

The questionnaire used to survey how journalists perceive quality in journalism was designed based on experience gained from previous research concerned partially or totally with the issue under study. Several international studies have turned their attention to theoretical factors linked to the professional values of journalism (Deuze, 2005). Others have used surveys to weigh fundamental concepts –such as objectivity– against daily practices developed in Denmark (Skovsgaard, Albæk, Bro & De-Vreese, 2012; Pihl-Thingvad, 2014), Sweden (Strömbäck, Karlsson & Hopmann, 2012) and Brazil (Herscovitz, 2004). Other research has compared ideological bias in professional work (Patterson & Donsbach, 2010) or has mapped out journalistic cultures in 18 countries (Hanitzsch & al., 2011). Papers such as Amado's report on Argentina (2012) also point to a need for a methodological effort to assess the state of the profession.

Studies undertaken recently in Spain have established similar approaches, albeit not focused on quality but on the general question of professionalism (Túñez & Martínez, 2014). Gómez-Mompart (2010) studied the topic of social and political issues and professional culture among journalists based on two hundred long interviews with media professionals working in the Region of Valencia (Spain) with an average of at least twenty years of experience. The report asked journalists about corporate internal and external factors or ideological issues that may determine their work. Their nuanced and subjective answers helped shift the focus of the survey towards specific parameters and scales that simplified conclusions (Gómez-Mompart, 2010:33). When defining the questionnaire, the aforementioned experiences were considered alongside the specific scientific background referred to hereunder for each section.

> For years, traditional media have been immersed in a technological transition towards digitization that not only affects the business models and management of media companies but also has a bearing on the manner in which they produce the information they offer their readership or audience.

The first part focused on issues concerning the structure and behavior of the news outlet in terms of quality. To that end, indicators proposed by Merrill and Lowenstein in «Media, Messages and Men» (1971) and Bogart in «Press and Public» (1989), were contrasted against all three groups of indices (work, journalistic and corporate) described by De-Pablos and Mateos (2004), in addition to the journalistic ethics thesaurus prepared by the research team managed by Alsius (Alsius & Salgado, 2010). Consequently, the indicators and questions in the first section of the survey refer to: independence of the news outlet; press freedom; diversity among columnists; role of the business owner; newsroom statute; level of education of the journalist; job security; decent wage; reasonable working hours; percentage of advertising; compliance with ethical standards; recognition of a conscience clause; level of transparency when processing information; issues avoided; use of news agencies; number of writers in terms of the work load or relevant topics.

The questions in the second section (Information processing) were based on «Added Value Journalism» (AVJ), a measurement pattern developed by researchers from the Pontifical Catholic University of Chile (Alessandri & al., 2001), and specifically on the definition set out subsequently by Téramo (2006). Téramo established ten standards for Quality in Journalistic Information (reliability, relevance, interest, proportion, adaptation, transparency, clarity, intelligibility, integration and impact). These standards were taken into account alongside a selection of the indicators tested for TV news programs by Israel & Pomares (2013: 156-157), such as indicators linked to topic (relevance and hierarchy of the news); selection criteria (news values); indicators on the processing and presentation of news; on people, sources and intercultural diversity, and space-time indicators or news location.

As a result, the questions in this section focused on the use of primary data sources; the presence of relevant information; percentage of original topics; original features; news addressing similar realities; direct access to events; handling of protagonists; investigative journalism; quality of photojournalism and original infographics and graphs.

In the third section of the survey, we posed eleven questions on due care and diligence in news production. To do so, we considered a selection of AVJ indices alongside indicators proposed by the Mexican Network of Quality in Journalism (Various, 2006). Consequently, questions touch upon principles that are directly related, on the one hand, to the journalist's work, education, commitment and professional ethics, and on the other, to other issues linked to values or principles that depend directly on the work environment. We also took into consideration factors developed in the thesis written by González (2011: 258-345), who combined an analysis of formal factors, aiming to detect potential technical flaws and errors in the presentation and transmission, with a content analysis that focused on three elements: diversity, independence (including the level of facticity, distinguishing between facts, statements and conjectures) and news production .

As a result, the third section concentrates on questions linked to indicators specifically tied to the quality of the journalist's work: quality of copy/broadcast; linguistic proficiency; appropriate language; facticity of information; diversity of topics, protagonists and spheres; intercultural diversity; frequency of quotes; plurality of sources; corroboration of data offered; percentage of institutional and/or corporate sources; predominant focus in the choice between «emotion» as opposed to «information». These results will be studied in detail and broken down in the following section.

The last section of the questionnaire sounds out professionals to record their opinion on the causes and reasons that undermine quality in journalism. Previous qualitative research (Parreño, 2013:112-113) was used to this effect. The seven issues addressed set out a series of distinctions and clarifications that link the quality of the news product or the lack thereof to factors such as job insecurity, the economic downturn, adaptation to new technologies; the generation gap; and trends including content homogenization, the prevalence of instant, real-time information; and the loss of professional values.

The point of departure for the main hypothesis was as follows: Journalism professionals in Spain know that both the economic crisis –which has been affecting the economy, media and technology for several years– and job insecurity are having a serious impact on quality in journalism and a loss of values in the profession. As aforementioned, for the purpose of the survey, we contacted a varied sample of professionals practicing journalism in Spain at present.

3. Analysis and results

The general opinion among respondents is that there has been a widespread loss of the core values of the profession over the last few years, as noted by 81% of the respondents, compared to 19% who deny the existence of the decrease. On the whole, a detailed analysis of the respondents does not present notable differences in terms of sex, age or position: 80% of the sample (managers, editors-in-chief, editors and section editors) acknowledge the decline.

The most relevant factor when offering a pessimistic view of the values upheld by the profession is the variable linked to the news outlet of employment, with differences exceeding 25%. While 70% of radio journalists admit to the decline, this figure rises to 96% in the case of television. By age, it is notable to see that professionals aged 51-65 are more aware (by eight percentage points) of the loss of values than journalists under 50 years old. Nevertheless, journalists with more than two decades of experience perceived the deterioration most clearly.

When considering the reasons that influence this crisis of the professional model, half of the journalists (51%) pinpoint the neglect of four fundamental elements in journalism: contrast, rigor, honesty and quality. Television journalists once again take first place (76%) when identifying this cause, followed at a rela-

Table 1. Online survey Quality in journalism as perceived by Journalists (June/July 2013)					
363 journalists: 55% Men (198); 45% Women (165)					
News outlet		Position		Type of contract	
Print newspaper	31% (114)	Reporter	58% (210)	Staff	69% (249)
Television	21% (75)	Section editor or editor	12% (45)	Contributor	15% (54)
Online newspaper	18% (66)	Editor in chief or deputy director	7% (27)	Freelance	13% (48)
Radio	14% (51)	Manager	5% (18)	Intern	3% (12)
Print magazine	11% (39)	Other	18% (63)		
Online magazine	5% (18)				

tive distance by print journalists (working at newspapers and magazines), who account for 60% of the respondents. The second cause listed by respondents in interpreting the loss of values is the devaluation of the social prestige of the profession, an opinion shared by one in three journalists.

3.1. Professional opinion regarding due care and diligence in news production

Findings referring to care and diligence due in news production reveal that, despite the aforementioned responses, Spanish journalists are highly satisfied with the quality of the journalism in their news outlets. Approximately 80% of the respondents consider the narrative and copy in their media and the level of linguistic proficiency to be sufficient or good.

Similarly, 59% of the respondents consider that their news outlets almost always use appropriate language (only 5% state it is almost never used; 36% say it is used inconsistently). In general, there is a consensus among the answers in this section; around 40-50% consider the quality of the informative output, in its diversity of forms, to be sufficient. Therefore, we need to look at the nuances to draw more detailed conclusions regarding their perception of the quality of journalism in their corresponding companies. We see a clear paradox in terms of cultural or social representation (topics, protagonists or spheres) on the one hand and the presence of statements from personal sources in information on the other. As a result, 88% told us that the number of statements or quotes in the journalistic genres is adequate or even abundant.

However, this presence runs contrary to the representativeness of journalistic output, where only 68% defined the plurality of the sources in their reports as «adequate» (56%) or «high» (12%). The difference, therefore, between the use of statements (88%) and their plurality (68%) is 20% in the most neutral or positive considerations. These results obviously infer that this negatively affects the quality of the information.

Alongside the sizeable presence of institutional and corporate sources, according to 30% of the respondents, the diversity of topics, protagonists and spheres in the information is poor. Nevertheless, the majority consider it to be adequate (53%). In a similar vein, 45% consider intercultural diversity in their news outlet to be poor, whereas 44% define it as adequate and only 12% describe it as high. In any case, the majority (53%) states that there is a balance in terms of the protagonists of the information, although this balance is considered to be «poor» by 35% of the respondents. With regards to contrasting the information provided by the sources, the majority note that verification protocols are adequate (48%), although 33% consider that data is corroborated poorly. Equally significant, in terms of the social and professional context of the journalist, is the answer provided in relation to the level of «facticity», i.e. what journalists do to stop their reports mixing up facts, statements and conjectures. Considering their responses, 50% state that they sometimes get mixed up and 18% state that this occurs most of the time.

Last but not least, we asked journalists to assess whether the information presented in their news outlet lent more towards emotion or pure information. Their responses showed that there does not seem to be a huge difference between both options. Consequently, 45% believe both models (emotion vs. information) are evenly balanced in their offer; 33% consider information trumps emotion; and 23% affirm that emotion currently predominates over information.

Table 2. Quality in copy and linguistic proficiency		
Define the copy/broadcast in your news outlet.		
Good	126	35%
Acceptable	162	45%
Poor	72	20%
Define linguistic proficiency in your news outlet.		
Good	141	40%
Acceptable	141	40%
Poor	72	20%

Table 3. On the presence of personal sources		
Define the frequency of statements or quotes in your news outlet.		
Poor	45	13%
Adequate	186	52%
High	129	36%

4. Discussion. Reasons influencing the loss of quality in journalism

Results show that Spanish journalism professionals, despite being aware of the loss of quality in news production, attribute this situation to professional context and not to their lack of education or knowledge of the values required to perform their job. This positive, albeit not excellent, self-perception ties in with the high level of professionalism that exists in the newsrooms according to the respondents (85% stated the average level of education in their news outlets corresponds to degrees in Journalism or Audiovisual Communication; 95% when this is extended to university degrees in other fields).

If this is the case, what causes the deterioration in the quality of news production that they themselves have detected? To answer this question, respondents fall back on a range of factors that can be classified into three broad groups of reasons:

1) Current conditions in which professional work is undertaken. Journalists maintain that the decline in quality is closely linked to the conditions under which they perform their work. Respondents with a high level of job security represent 38% of the total, whereas 34% note that only half of the staff in their news outlet enjoys this security and almost one third (28%) states the level of job security is poor. Apart from these facts, which are linked to the crisis affecting the sector, other issues should also be considered: 39% claim that wage levels are barely sufficient. An identical figure (39%) refers to those who assert that this occurs only in certain positions. Those claiming to have an appropriate salary amount to 22% of the respondents. As regards working hours, 36% say they barely enjoy reasonable working hours, whilst 34% are relatively happy with their working hours. This ties in which the different production routines in each type of medium. Consequently, 54% of respondents with unreasonable working hours are employed by print newspapers, whereas 27% of those with the opposite opinion work in television. There is a great deal of consensus (69%) when noting that the reporter-workload ratio is poor. Indeed, one in seven journalists claims that another of the causes of the loss of quality could be the accumulation of tasks. The perception that the lack of time prevents an in-depth analysis of the content is upheld by 22% of the respondents; 18% believe that immediacy and instant communication in real time leads to serious errors in information.

In this sense, job insecurity stands as the greatest threat to optimal professional standards. One in five respondents claims that the lack of job security weakens the critical capacity of journalists and, consequently, affects the quality of their work. The data collected also reveals that this insecurity runs parallel to fact that experienced reporters are being replaced by contributors or interns.

2) Lack of investment by news companies. The survey brought to light that 37% of the journalists associate the lack of investment in this field with the decline in the quality of journalism. Two in ten professionals perceive that the media corporations have little interest in quality, and maintain that they put wage costs and advertising income above quality. Along these lines, 16% of the respondents claim that companies hardly ever invest in the production of good information or original content. This also results in another negative issue affecting the quality of journalism: homogeneous content across media. According to 14% of the respondents, «topics or coverage that did well on other media are imitated». Nevertheless, the honesty of the respondents is revealed upon admitting (11%) that the inaccuracies that prevent them offering a quality product are, in a general sense, «the result of a range of bad habits». Additionally, one in ten claimed that journalists are often negligent with content and form when presenting the information.

Table 4. On the plurality of sources and informative diversity.		
Define the plurality of sources offered by your news outlet.		
Poor	114	32%
Adequate	201	56%
High	42	12%
Qualify the percentage of institutional and/or corporate sources quoted in the information in your news outlet		
Very high	168	48%
Average	159	46%
Low	21	6%
Define the diversity of topics, protagonists or spheres in the information in your news outlet.		
Poor	108	30%
Adequate	189	53%
High	60	17%

Table 5. On data verification and «facticity»		
Define data verification in the information provided by your news outlet.		
Poor	117	33%
Adequate	171	48%
High	72	20%
As regards the level of «facticity» of the information, do you think facts, statements and conjectures get mixed up in your news outlet?		
Hardly ever	114	32%
Sometimes	180	50%
Always	66	18%

Table 6. On the prevalent emphasis in the news		
Would you say «emotion» or «information» prevails in your news outlet?		
Emotion	81	23%
Balance	159	45%
Information	117	33%

3) Adaptation to new technologies. One in four respondents (23%) refers to the lack of time to reflect on information as the main factor in the loss of quality. Approximately 15% consider that contemporary production methods improve the possibilities, but give them «less capacity to cover content», which can increase the number of potential errors. In terms of social media, 12% consider that competition in these networks has a negative effect on the content. Similarly, 24% claim there is a large gap between traditional and online newsrooms. The latter consists mainly of younger journalists. According to the respondents, this has a negative effect on journalism as it hinders the contact between senior and junior journalists. This fact is further complicated by the early retirement and redundancies of senior journalists, who are unable to pass established journalism standards onto the new generations of professionals.

5. Conclusions

The picture painted by the results of the questionnaire corroborates our initial hypothesis. Deriving from both the circumstances of the economic crisis and a combination of internal and external factors, 81% of active Spanish journalists that responded to the questionnaire believe there has been a drop in the quality of the journalistic output. Furthermore, 34% perceive a devaluation of the social prestige of journalism as a profession in line with surveys undertaken by CIS (2013). The limited level of political and economic independence of the news outlets (noted by 48%) or the interference of employers in their work (which 44% found to be excessive) exacerbate the changing scenario in the context of the economic downturn. Although they do not feel that this circumstance jeopardizes press freedom, they are aware of the existence of topics that are systematically ignored in their companies (41%), and of the poor plurality of opinion offered to the audience (42%).

Respondents attribute the decline in quality to the job insecurity in journalism (inexperienced contributors replacing experienced writers; accumulation of tasks; etc.). These ideas tie in with the findings of the 2014 Annual Report on Journalism (Spanish acronym, IAPP), which revealed that 59.6% of media professionals pointed to the increase in unemployment and the job insecurity it causes as the main problems affecting journalism, followed by a lack of economic or political independence (11%) (IAPP, 2014:45).

Answers concerning the manner in which information is presented (their most direct responsibility) generate a consensus of around 40-50% who consider the quality of the information to be adequate or sufficient. It is important to note that approximately 80% of the respondents consider news is written or reported in an adequate or correct manner. However, they are more critical towards the lack of representation and the plurality of sources, intercultural diversity, lack of diversity in topics, relevance of information and the corroboration of the sources of information.

Therefore, journalists are aware of the hindrances that condition their work and that job insecurity is an evident threat to quality. Despite offering a generous, albeit critical, view of the information they produce, they acknowledge the need to boost original content, allow closer access to events and to generally strengthen compliance with ethical standards and offer a greater access to professional tools to improve the performance of their work in a democratic society.

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Primary Teachers' Technological, Pedagogical and Content Knowledge

Conocimientos tecnológicos, pedagógicos y disciplinares del profesorado de Primaria

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ABSTRACT

The emergence of Information and Communication Technologies (ICTs) poses new educational challenges for teachers, to which it can respond from a consistent training model. This study has as its aim to analyze the technological, pedagogical and content knowledge needed for Primary Education teachers to integrate ICTs into teaching. A research work based on a quantitative non-experimental methodology which involved 224 Preschool and Primary Education teachers working in the province of Alicante (Spain) was performed with that aim. The important results showed that teachers are more knowledgeable in the pedagogical and content fields than in technology, which means that their level of technological knowledge does not suffice to integrate ICTs into their teaching tasks. Significant differences were additionally identified between gender and years of experience, together with the relationship between the fun use of technology and the knowledge of its essential aspects. Our findings confirm the need for a digital literacy campaign addressed to teachers, involving not only a technological type of training but also an overall pedagogical and content approach. This is in keeping with the TPACK model (Technological, Pedagogical and Content Knowledge), which appears as a reference framework to be taken into account when it comes to teachers' professional development and its connection with the teaching-learning processes in the classroom wherever Information and Communication Technologies are present.

RESUMEN

La emergencia de las tecnologías de información y comunicación (TIC) plantea nuevos desafíos educativos al profesorado, a los cuales puede responder desde un modelo de formación coherente. El propósito de este estudio es analizar los conocimientos tecnológicos, pedagógicos y disciplinares del profesorado de Educación Primaria, necesarios para la integración de las TIC en la labor docente. Para ello, se llevó a cabo una investigación con una metodología cuantitativa de carácter no experimental en la que participaron 224 profesores de Educación Infantil y Primaria de la provincia de Alicante. Los resultados mostraron que los docentes poseen mayores conocimientos pedagógicos y disciplinares que tecnológicos, lo que conlleva a escasos conocimientos para la integración de las TIC en la labor docente. Se constataron, además, diferencias significativas entre el género y los años de experiencia docente, y la relación entre el uso lúdico de la tecnología y los conocimientos sobre sus aspectos fundamentales. Según los resultados obtenidos, se corrobora la necesidad de una alfabetización digital del profesorado abordada no solo desde una formación tecnológica, sino también pedagógica y disciplinar de forma global. Ello responde al modelo TPACK (Technological, Pedagogical and Content Knowledge), el cual se contempla como un marco de referencia a tener en cuenta por lo que respecta al desarrollo profesional del profesorado y su vinculación a los procesos de enseñanza-aprendizaje en el aula donde las TIC estén presentes.

KEYWORDS | PALABRAS CLAVE

Technology, pedagogy, content, training, teachers, ICT, knowledge, instruction.
Tecnología, pedagogía, disciplina, formación, profesorado, TIC, conocimiento, instrucción.

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1. Introduction

ICTs offer a new and wide range of possibilities for the design and implementation of teaching-learning proposals as an essential part of education that imply the adoption of new teaching methodologies meant to boost students' cognitive development; examples can be found in the proposals made by Sánchez, Prendes and Fernández (2013) and Marín, Negre and Pérez (2014). Nevertheless, the mere introduction of technological media does not guarantee success in the teaching-learning process, since a suitable didactic design is required too. The responsibility for providing the different resources therefore falls upon teachers, who have to refine their training accordingly. A large number of researchers agree both on the central role that ICT training has for teachers and on the need for the latter to achieve digital literacy (Paechter, 2010).

The traditional model based on the simple transmission of information from the teacher to the student has started to prove ineffective for learning development: «a change in the teacher's role» is required (Cabero, 2003; De Benito & al., 2013). Furthermore, «information and communication technologies reach up to the last corner of everyday life» (Aguaded-Gómez & Pérez-Rodríguez, 2012), what suffices to justify the use of ICTs in the classroom that, in our opinion, cannot ignore what exists in society.

Before this situation, the new educational paradigm needs to incorporate both new skills and capabilities (Herrera & Bravo, 2012) and new resources, technological ones in this case, which can make it easier for students to acquire basic competences. Teachers' digital literacy campaigns thus seem essential to us when it comes to mastery in the use of technological instruments and their educational integration. The TPACK (Technological Pedagogical Content Knowledge) model developed by Mischra and Koehler (2006) identifies the specific knowledge that teachers need to own for that integration to exist. According to this model, an adequate utilisation of technology in teaching requires a type of teacher training based on different sorts of knowledge, which can be summarised in the idea of being able to use an effective methodology for the implementation of ICTs supporting pedagogical strategies and methods in relation to a specific discipline. The present proposal about ICT integration into the educational context thus means a systematisation and re-definition of the role played by the teaching staff as active agents in educational progress. It also implies –as explained in more detail in one of our previous works (Roig & Flores, 2014)– a model where teachers' knowledge is re-defined and interacts in an original way for the purpose of dealing with the teacher training required within the new learning scenarios arising from ICT presence.

The TPACK model therefore represents the knowledge needed by teachers bringing together content knowledge, technological knowledge and pedagogical knowledge with the aim of integrating ICTs into teaching-learning processes (Graham, 2011). Thus, a variety of other knowledge types result from the intersection of these three general types (Mishra & Koehler, 2006):

- Technological Knowledge (TK): it refers to the knowledge about all sorts of technology –not only computers.
- Content Knowledge (CK): it covers the knowledge linked to a subject matter.
- Pedagogical Knowledge, PK: it corresponds to teaching methods and processes, and includes: knowledge about classroom management and organisation; curricular analysis and planning; and student's learning.
- Pedagogical Content Knowledge (PCK), referred to the content knowledge associated with the teaching-learning process, integrating content and pedagogy with the aim of developing better teaching practices.
- Technological Content Knowledge (TCK), associated with the knowledge of the way in which technology can create new learning scenarios for specific contents.
- Technological Pedagogical Knowledge (TPK): it entails understanding how several technological tools can be used in teaching, along with the conviction that the use of technology can change the way in which teachers develop their professional activity.
- Technological Pedagogical Content Knowledge (TPACK): this is the knowledge required for teachers to integrate technology into the teaching of any content area. Teachers have an intuitive knowledge of the complex interrelationships existing between the three basic component of knowledge (CK, PK, TK) which is reflected in their ability to teach using the appropriate pedagogical methods and technologies.

An optimal integration of technology consequently requires understanding and approaching the three types of knowledge (Technological Pedagogical Content Knowledge) collected in the core of this model. Numerous experiences have been developed under these premises, both in the context of initial teacher training (Jang & Chen, 2010; Pamuk, 2012; Srisawasdi, 2012; Maeng, Mulvey, Smetana & Bell, 2013; Mouza, Karchmer-Klein, Nandakumar & Oz-

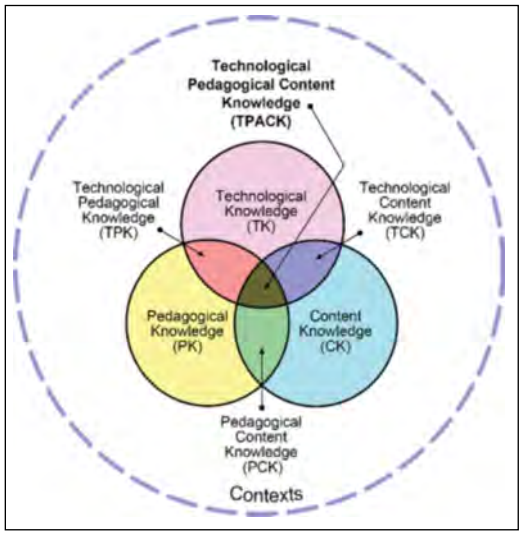

Figure 1. TPACK Model (www.tpack.org).

den, 2014) and in different content fields and educational levels (Erdogan & Sahin, 2010; Graham, Borup & Smith, 2011; Jang & Tsai, 2012; Lescano, 2013; Lye, 2013; Nordin, Davis & Tengku, 2013). In the present case, it is our belief that the TPACK model can be applied in Primary Education, which requires the a priori establishment of the perceptions that teachers who develop their professional activity in these educational stages own in connection with the knowledge made explicit in the TPACK model. Such perceptions will serve as a guide to define the integration of ICTs into the classroom (Kim & al., 2013; Lin, Tsai, Chai & Lee, 2013; Koh & Chai, 2014).

2. Materials and methods

Based on the TPACK model, the present research sets itself the goal of knowing and analysing technological, pedagogical and content knowledge with regard to teachers' ICT integration into their teaching tasks, in this specific case, in the Preschool and Primary Education Centres located in the province of Alicante (Spain). It is likewise our intention to inquire about whether a link exists between the results obtained and the variables 'gender' and 'years of experience' – referred to participants.

Concerning the method utilised, the choice made was a descriptive, comparative and correlational non-experimental quantitative, questionnaire-based design (McMillan & Shumacher, 2005). In our view, this was the most suitable method taking into account that the research was developed within a real context (Lozada & López, 2003) – as it allowed us to analyse, to get to know, to describe, and to discover reality.

The sample was selected in an incidental, convenience-based way (McMillan & Shumacher, 2005), and it included 224 teachers who imparted classes in 12 public Preschool and Primary Education centres of the Alicante province during the 2013/2014 year. 183 of them (81.7%) were females, and 41 (18.3%) males, the age range being between 21 and 60.

As for the information collecting instrument, a translated and simplified version of the original questionnaire elaborated by Schmidt, Baran, Thompson, Mishra, Koehler and Shin (2009) was used to analyse teachers' knowledge according to the TPACK model. It deserves to be highlighted that this questionnaire has a «dynamic» nature, insofar as subsequent studies have focused on it (Yeh, Hsu, Wu, Hwang and Lin, 2014; Yurdakul & al., 2012; Saengbanchong, Wiratchai & Bowarnkitiwong, 2014) and it has been used in various research works, too (Nordin, Davis & Tengku, 2013; Kopcha, Ottenbreit-Lefwich, Jung & Baser, 2014). It has Cronbach's α reliability studies between 0.82 and 0.92 for its different subscales, and the content validity ratio proposed by Lawshe (1975) served to examine instrument content validity (IVC); the instrument was subjected to the criterion of 12 expert judges, university lecturers from the Educational Technology field. The overall IVC coefficient revealed a high ratio (.73) –highly suitable for the number of expert evaluators involved.

The questionnaire utilised covers with not only the same dimensions as the original questionnaire but also with the same demographic data (working centre; gender; age; and years of experience). It consists of 29 items on a 5-point Likert scale –I totally disagree (TD); I disagree (D); I neither agree nor disagree (N); I agree (A); and I totally agree (TA)– which relate to the diverse intersections which –as seen above– shape the TPACK model: TK: items 1, 2, 3, 4, 5, 6 and 7; CK: items 8, 9 and 10; PK: items 11, 12, 13, 14, 15, 16 and 17; PCK: item 18; TCK: item 19; TPK: items 20, 21, 22, 23 and 24; and TPACK: items 25, 26, 27, 28 and 29.

In relation to design, it is worth highlighting that a basic correlation method or ex post facto study was used in this research. More precisely, this is a transversal study with a single-group ex post facto design or predictive-type correlational design (Creswell, 2012) in which a large group of subjects is selected and one or several independent variables (gender, years of experience, etc.) related to the dependent variable (manipulation by selection of values) are measured, groups are formed, and the dependent variable (TPACK) is subsequently measured.

As for the procedure, questionnaires were distributed both in paper and in electronic format –using Google Drive– throughout the 2013/2014 academic year. A descriptive data examination was firstly performed with regard to statistical analysis. The comparison of means *t*-test for independent samples served to assess the influence exerted by teachers' gender on TPACK knowledge, and the comparison of results according to years of experience (since more than two groups are to be compared) was possible through a covariance univariate analysis (or single-factor ANOVA); finally, Pearson's linear correlation r coefficient helped establish the relationship between the different variables.

The Statistical Package for Social Sciences (SPSS) version 21 for MacOS was used for data structuring, organisation and analysis.

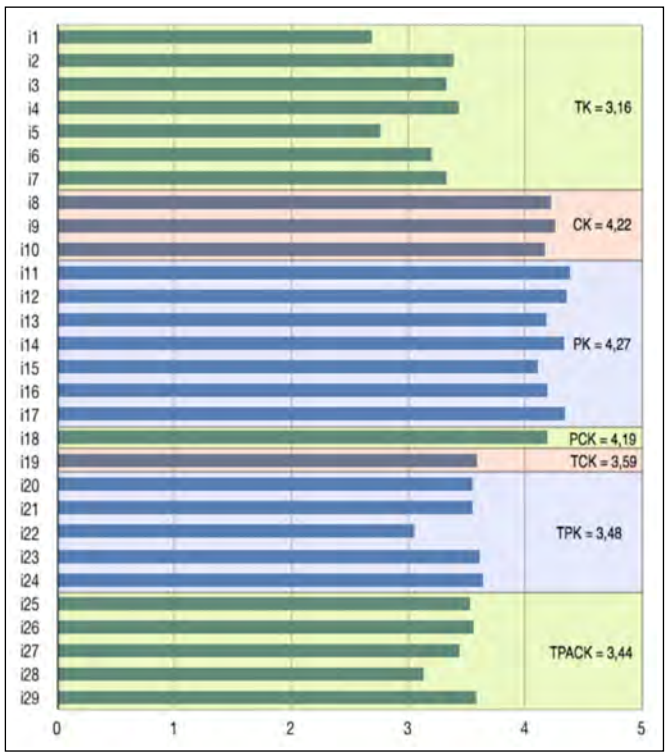

Figure 2. Descriptive analysis of the TPACK questionnaire.

3. Results

3.1. Descriptive analysis: TPACK model

The development of our study started from the structure of the TPACK questionnaire according to the seven factors specified in the Instruments subsection. Figure 2 shows the results corresponding to the descriptive statistics obtained for each item on all seven subscales.

On the whole, teachers are more knowledgeable in non-technology-related TPACK model areas. The factors with better behaviours would be content knowledge CK (M=4.22; SD=0.694), pedagogical knowledge PK (M=4.27; SD=0.61) and their intersection: pedagogical content knowledge PCK (M=4.19; SD=0.70). Teachers consider that they have enough knowledge about the subject that they impart (M=4.22; SD=0.80) and know how to apply that knowledge (M=4.26; SD=0.74). They also see themselves as being able not only to assess the performance of a particular student in class (M=4.38; SD= 0.71), adapting their teaching to multiple learning styles (M=4.18; SD=0.76) and assessing students' learning in different subjects (M=4.33; SD=0.69), but also to organise and maintain an orderly development of the class (M=4.34; SD=0.67). In short, and adding up both skills, teachers believe that they can choose effective didactic approaches meant to guide students' reasoning and learning (M=4.19; SD= 0.67).

The factor where teachers obtain the worst result is that of technological knowledge TK (M=3.16; SD=0.89), closely followed by the intersections of the three basic types of knowledge (TK, CK, PK) where technology plays a role, namely: technological content knowledge TCK (M=3.59; SD=0.95); technological pedagogical knowledge TPK (M=3.48; SD=0.83) and technology, pedagogical and content knowledge TPACK (M=3.45; SD=0.96). Teachers do not think they will be able to solve technical problems (M=2.69; SD=1.20); and neither do they think that they own much knowledge about different technology elements (M=2.76; SD=1.11). Views additionally differ when it comes to keeping up to date with important new technologies (M=3.33; SD=1.10), both in terms of using technology for fun purposes (M=3.43; SD=1.21) and regarding the availability of sufficient opportunities to work with different technology elements (M=3.33; SD=1.08). In turn, there are also a multiplicity of views about the knowledge of technological elements which they can use to improve understanding (M=3.59; SD=0.95), in the choice of technological elements meant to improve the learning of a didactic unit (M=3.55; SD=1.02), and in the adaptation of technological elements recently learnt by the teacher to various didactic activities in the classroom (M=3.64; SD=0.99).

As for the issues directly related to TPACK know-

ledge, teachers are not too sure about how to elaborate a Didactic Unit where contents, technological elements and the didactic approach can combine (M= 3.53; SD=1.03); and neither do they clearly know how to choose the technology that will subsequently be used to complement what is taught (M=3.56; SD= 1.00) or how to utilise classroom strategies that combine contents, technology, and didactical approaches (M=3.13; SD=1.20).

3.2. Comparative analysis according to gender and years of teaching experience

After carrying out the descriptive analysis, a comparison was drawn between the means of the different TPACK model components for the purpose of checking if significant differences existed according to the independent variables (gender and years of experience). With that aim, *t*-tests for independent samples were performed when only two groups were compared (according to gender), and a univariate analysis of variance (ANOVA) in cases where the comparison was made between more than two groups, according to years of teaching experience. Pearson's linear correlation r coefficient served to analyse the relationship between the different variables.

3.2.1. Comparison of means according to gender

A *t*-test for independent samples was carried out in order to compare TPACK model components among men and women; its results can be seen in table 1.

Significant differences appeared in all the knowledge sectors associated with technology, such as technological knowledge TK for men (M=3.56; SD= 0.75) and women (M=3.07; SD=0.90); t(222)= 3.023, p=0.002. The same significant differences were found in technological content knowledge TCK in males (M=3.90; SD=0.86) and females (M=3.52; SD=0.96); t(222)=2,320, p=0.021, as well as in technological, pedagogical and content knowledge TPACK among males (M=3.72; SD=0.84) and females (M=3.38; SD= 0.98); t(222)= 2.043, p= 0.042.

The aforesaid results suggest that men are more familiarised with technical knowledge and its didactic application than women or, alternatively, that women reject technologies to a greater extent. No significant differences appeared in the rest of factors. The fun use of technology according to gender was additionally examined, with no significant differences being found between males (M=3.44; SD= 1.28) and females (M=3.43; SD=1.20); t(222)= 0.061, p=0.951).

3.2.2. Comparison of means according to years of teaching experience

An ANOVA single-factor variance analysis subsequently helped us to compare the effect caused by years of teaching experience on the knowledge for ICT integration following the TPACK model. As for participants' years of experience, the 224 sample members were classified into four subgroups formed by 57 individuals (25.4 % of the sample) whose experience ranged between 0 and 7 years; 79 people (35.3 %) with 8-to-15 years' experience; 37 participants (16.5 %) who had between 16 and 23 years' experience; and the remaining 51 (22.8 %), whose experience exceeded 23 years.

According to the results expressed in Table 2, it was found that years of experience cause a significant effect on TPACK model knowledge at a $p<0.05$ level for technology-related factors such as technological knowledge TK [F(5.224)=2.865, p=0,016], personal involvement PI [F(3.220)=11.946, p=0,000], technological content knowledge TCK [F(3.220)= 8.454, p=0.000], technological pedagogical knowledge TPK [F(3.220)=5.503, p=0.004], and technological pedagogical content knowledge TPACK [F(3.220)= 8.936, p=0.000].

Post-hoc comparisons using HDS Tukey's test indicate that the means among teachers with 0-to-7 years' experience significantly differed from those with over 23 years' experience for all these components. More specifically, in the case of the TK factor, the means of teachers with 0-7 years' experience (M= 3.46; SD=0.80) were significantly different from those of teachers who accumulate an experience ranging between 16 and 23 years (M=3.00; SD=0.95) as well as from those with over 23 years' experience

Table 1. Means, standard deviations and t-test for independent samples according to gender

Factors	Males		Females		T-test	
TPACK Model	M	SD	M	SD	$t_{(222)}$	p
TK	3,56	0,75	3,07	0,90	3,203	0,002
CK	4,28	0,55	4,20	0,72	0,618	0,537
K	4,20	0,54	4,29	0,62	-0,832	0,406
PCK	4,15	0,61	4,20	0,71	-0,418	0,676
TCK	3,90	0,86	3,52	0,96	2,320	0,021
TPK	3,72	0,78	3,43	0,88	1,946	0,053
TPACK	3,72	0,84	3,38	0,98	2,043	0,042

* All the equal variances according to Levene's Test have been assumed (p >0.05).

(M= 2.61; SD= 0.91). The same occurs for the TCK factor between the groups of 0-7 years (M= 3.86; SD= 0.86) and >23 years (M=3.08; SD= 1.07), for the TPK factor between the groups of 0-7 years (M=3.59; SD=0.74) and >23 years (M=3.12; SD=1.00), and in TPACK, with significant differences becoming visible between 0-7 years (M=3.55; SD= 0.82) and >23 years (M=2.93; SD= 1.12). However, no significant differences appear between the remaining intermediate educational levels. On the whole, it can be said that significant differences arise for the TK, TCK, TPK and TPACK factors between few and many years of experience when it comes to technological knowledge and its didactic application.

Table 2. Means and single factor ANOVA analysis according to years of teaching experience

Factors	YEARS OF TEACHING EXPERIENCE				ANOVA	
TPACK Model	0-7 years	8-15 years	16-23 years	>23 years	F	p
TK	3,46	3,37	3,00	2,61	11,946	0,000
CK	4,07	4,39	4,25	4,08	3,342	0,160
PK	4,10	4,32	4,34	4,32	2,096	0,102
PCK	4,01	4,20	4,22	4,33	1,935	0,125
TCK	3,86	3,78	3,49	3,08	8,454	0,000
TPK	3,59	3,65	3,46	3,12	4,503	0,004
TPACK	3,55	3,76	3,33	2,93	8,936	0,000

* The mean homogeneity variance test according to Levene's statistic results in equal variances for every case (p >0.05).

3.2.3. Relationship between the different variables

Pearson's linear correlation r coefficient was analysed in order to study the relationship existing between the different TPACK model components, and between the latter and teaching experience with the fun use of technology. The correlational results can be found in Table 3 below.

A careful observation of table 3 allows us to appreciate the links existing between the different TPACK model components. The components more closely related to one another are the intersections directly linked to technology, such as TCK, TPK and TPACK. A strong positive correlation exists between the variables TCK and TPK (r=0.840, n=224, p= 0.000), between TCK and TPACK (r=0.821, n= 224, p=0.000) and between TPK and TPACK (r=0.879, n=224, p=0.000). Similarly, there is a fairly strong positive correlation between TK and these three variables (between TK and TCK r=0.761, n=224, p=0.000; between TK and TPK r=0.701, n=224, p=0.000, and between TK and TPACK r=0.745, n=224, p=0.000). An increase of technological knowledge was correlated with the increased understanding of: technological content knowledge; technological pedagogical knowledge; and technological, pedagogical and content knowledge. Nevertheless, technical, pedagogical and content knowledge TPACK presents a positive –though weak– correlation with TPACK (between CK and TPACK r=0.271, n=224, p=0.000; between PK and TPACK r= 0.238, n=224, p=0.000; between PCK and TPACK r=0.257, n=224, p=0.000).

With regard to years of teaching experience, this factor correlates negatively –though not excessively– with factors linked to technology. By way of example, years of teaching experience correlate negatively with technological knowledge r=-0.362, n=224, p= 0.000; with TCK r=-0.308, n=224, p=0.000; and global knowledge TPACK r=-0.274, n=224, p= 0.000). Nevertheless, no correlation exists between years of experience and content knowledge or pedagogical knowledge.

The link between the fun use of technology and the model components was analysed as well. A fairly strong positive correlation appeared between the fun use of technology and technological knowledge TK, r= 0.696, n= 224, p=0.000; and also positive with TCK r=0.525, n=224, p=0.000; with TPK r=0.491, n= 224, p=0.000; and with TPACK=

Table 3. Correlations between variables according to Pearson's linear correlation r coefficient

	TK	CK	PK	PCK	TCK	TPK	TPACK	exp	i4
TK	1								
CK	0,281**	1							
PK	0,112	0,635**	1						
PCK	0,174**	0,500**	0,727**	1					
TCK	0,761**	0,228**	0,171*	0,244**	1				
TPK	0,701**	0,255**	0,250**	0,310**	0,840**	1			
TPACK	0,745**	0,271**	0,238**	0,257**	0,821**	0,879**	1		
exp	-0,362**	-0,026	0,123	0,151*	-0,308**	-0,209**	-0,274**	1	
i4	0,696**	0,243**	0,142*	0,245**	0,525**	0,491**	0,500**	-0,318**	1

** p<0,01; * p<0,05; exp=years of teaching experience; i4=fun use of technology

0.500, n=224; p=0.000. Furthermore, the fun use of technology presented a negative correlation with years of teaching experience r=-0.318, n=224, p=0.000.

4. Discussion and conclusions

As highlighted by Cabero (2003), a change in education is not possible without a change both in the teaching staff's mind-set and in curricular approaches. Technology consequently needs to be integrated into the educational context according to curricular and pedagogical needs, and not the other way round (Mishra & Koehler, 2006). For this reason, teachers must design such context on the basis of the three types of acquired knowledge –technological, pedagogical and content–that shape the TPACK model. Therefore, it will become essential to know what knowledge items are seen as acquired by teachers with the main aim of suggesting the guidelines for their training and professional development.

Results show that teachers in the Primary Education stage have more content and pedagogical knowledge than technological knowledge, as proved by the average scores obtained in each questionnaire factor. This confirms the premises posed by other researchers such as Schmidt and al. (2009) or Koh and Chai (2014) and, partially, the one developed by Nordin, Davis and Tengku (2013), insofar as results corresponding to technological knowledge were lower in the latter case.

As for technological knowledge, it deserves to be mentioned that women obtain worse results than men in this type of knowledge and its intersections with the others, since significant differences are visible in the TK, TCK and TPACK factors. Similarly, the study carried out by Erdogan and Sahin (2010) showed males achieving a higher score, not only in these dimensions but in all of them as a whole.

Moreover, the comparison of TPACK model results with years of teaching experience (which generally means older teachers) reveals the progressive reduction of technological knowledge in teachers with a greater teaching experience, significant differences appearing in every technological factor (TK, TCK, TPK and TPACK) between teachers with few and many years of teaching experience, as suggested by Koh and Chai (2014).

The results obtained according to the correlational analysis corroborate the interrelationship between the variables in the model that were graphically presupposed according to Figure 1. In tune with Erdogan and Sahin (2010), it can be concluded from the analysis of correlations between the different variables and the descriptive results that when low results are obtained in technological knowledge, low results are also obtained in its intersections with the other basic types of knowledge (pedagogical and content knowledge), which in turn entails low results in technological, pedagogical and content knowledge –needed for a good integration of ICTs into teaching tasks following the TPACK model.

The same as in the study carried out by Graham, Borup and Smith (2012), though referred exclusively to teachers in the initial training stage, a positive relationship can be inferred from the correlational analysis performed between: fun use of technology; technological knowledge; technological content knowledge; technological pedagogical knowledge; and technological, pedagogical and content knowledge. Therefore – in keeping with Kim and al. (2013) – the same as the utilisation of technological tools regularly used by students outside school in teaching boosts those students' motivation and interest, a fun use of technology on the part of teachers will surely reduce the degree of reluctance towards them and favour their use in the teaching process.

Concerning limitations and prospects, it is worth highlighting that even being optimistic with the study findings as far as ICT integration into teaching is concerned, one must be aware of the fact that these conclusions are provisional. This provisional nature of results has to do with the size of the sample –since no sample size calculation estimate could be made with a sample which was not probabilistic but convenience-based– and with the fact that the study scope cannot be generalised to the whole teaching profession –our work focuses on a single Spanish geographical area: the Alicante province. It is likewise necessary to be cautious with the results linked to gender differences, insofar as the sample was quite imbalanced with respect to this variable.

It would be interesting for future research initiatives to extend the study follow-up period so that participants can be assessed after some time has elapsed or once an ICT training process for teachers has started. This will help to check if variations exist in their answers and, consequently, to verify the potential appearance of increased knowledge according to the TPACK model with the passing of years. Another interesting possibility would consist in investigating the link between teachers' beliefs and practices because, as suggested by Graham, Borup and Smith (2012), that can prove of paramount importance when it comes to understanding the effective integration of technology.

In short, it is necessary to ensure the teaching

staff's digital literacy and, of course, to introduce modifications in their mind-set so that a change can be achieved in education as well as in teaching techniques – better suited to the new educational challenges generated by the presence of ICTs in today's society. The ultimate objective sought with our study was to provide a justification for the proposal of the TPACK model as a valid reference framework for the analysis of the teacher training-effective ICT integration tandem.

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ICT Use and Parental Mediation Perceived by Chilean Children

Uso de las TIC y mediación parental percibida por niños de Chile

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ABSTRACT

The use of Information and Communication Technologies (ICTs) has extended to all contexts of our lives in the last few years, modifying our communication, learning, entertainment and socialization habits. The aim of the present research is to investigate about primary-age children's habits with these tools, as well as these children's perception of parental mediation in this area. In this study we used an ex post facto descriptive methodology by survey. A questionnaire was applied for data recollection to 422 children of private schools in Santiago de Chile aged between 9 and 12 years old. The results point to an early access to electronic devices and the transversal and homogeneous use during childhood. There is no doubt that ICTs play an active role in daily life for most of these children. No significant differences in age or sex were detected in our study, but we encountered risky behaviours in how children use ICTs and in their perception of parental mediation. The complexity becomes more evident the more time they have with electronic devices connected to the Internet without adult supervision. This finding raises the need for the application of intervention programs on parental mediation of children's use of ICTs in order to promote a safe, responsible and ethical use of these tools.

RESUMEN

El uso de las tecnologías de la información y la comunicación (TIC) se ha ido masificando en los últimos años, modificando los hábitos de comunicación, aprendizaje, entretenimiento y de socialización. Hemos investigado sobre los hábitos de los menores con dichas herramientas, además de su percepción de la mediación parental en este terreno. Se presenta un estudio exploratorio, en el que se emplea metodología «ex post facto» descriptiva por encuesta, con un cuestionario como instrumento de recolección de datos aplicado a 422 niños/as de 9-12 años de colegios privados de Santiago de Chile. Los resultados indican que las TIC forman parte de la vida cotidiana para la mayoría de los niños/as. A pesar de no apreciarse diferencias significativas, en edad y género, se encontraron comportamientos de riesgo entre las características de uso y en la percepción de la mediación parental, por lo que vislumbramos la necesidad de implementar programas de intervención sobre mediación parental en el uso de las TIC, para así promover un uso seguro, responsable y ético de las tecnologías de la información y la comunicación. De los resultados deriva la reflexión en cuanto a la importancia de formar y fomentar desde temprana edad en el uso idóneo de las TIC, considerando que estas herramientas son utilizadas de forma cada vez más transversal y homogénea entre los más jóvenes.

KEYWORDS | PALABRAS CLAVE

Elementary education, minors, parental intervention, parental control, risks, digital competencies, educational research.
Educación primaria, menores, mediación parental, control parental, riesgos, competencias digitales, investigación educativa.

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1. Introduction and state of the art

Technological advances have changed our daily lives: communication or news reading are digital activities now. The most significant increase in the use of Information and Communication Technologies (ICTs) took place among the younger population. Minors are exposed, from a very early age, to ICTs (Lepicnik & Samec, 2013) and they use them without any specific training (Area, Gros & Marzal, 2008). They are active members of the «e-society» (MacPake, Sthepen & Plowman, 2007), who have a considerable proficiency in digital technologies that provides them with «hyperconnectivity» and ubiquity. This creates a digital gap between children and adults. Although the use of ICTs entails a series of advantages, it can also involve some risks for minors.

We analyse here how ICTs are used by 9 to 12 year-old children and how they perceive parental mediation. The study covered four of the technologies more widely used by children (the Internet, television, video games and mobile phones). We studied how they were used (weekly frequency, place, time and whether they were accompanied or not) and also parental mediation in that use (times, activities and contents). The variables of sex and age were also taken into consideration.

1.1. Children and ICTs

Research (Gutnick, Robb, Takeuchi & Kotler, 2010; Bringué & Sádaba, 2008; Sádaba & Bringué, 2010; Bringué, Sádaba & Tolsá, 2011) has shown some worrying data about children's use of the Internet: 80% of children between the ages of 5 to 9 surf the Web regularly and 60% of them say they do it without supervision. Research carried out by Bringué & Sádaba (2008) in Chile offers some data about possible Internet risks for children, pointing out that 5% of 10-year-old users have occasionally accessed pornographic websites and that 13% accessed violent contents. More recent research (Bringué, Sádaba & Tolsá, 2011) shows that more than half of the children aged between 6 and 9 are autonomous users and that 30% of minors use social networks such as Facebook. They also state the worrying fact that 50% of 10-year-old boys and 33% of 10-year-old girls state that they have met in person somebody they first met online. Although the Internet is a useful tool for the development of minors, some specialists (Bringué & Sádaba, 2008; Bringué, Sádaba & Tolsá, 2011; García & Bringué, 2007; Garmendia, Casado, Martínez & Garitaonandia, 2013; Livingstone, 2013) have shown the risks of accessing the Internet unsupervised or without having proper training: violence, pornography, addictions or cyberbullying, among others.

One could think that the presence of technologies that allow interactivity, ubiquity and mobility would have replaced the use of the television. However, recent research carried out by Mediametrie and Eurodata TV for the 8th edition of «Kids TV Report: Trends & Hits in Children's Programming in France, Germany, Italy, Spain & the UK» (2013) shows that daily television consumption among Europeans between 4 and 12 years of age during 2012 was 2 hours and 16 minutes. Research in Chile (CNTV, 2010; CNTV, 2012a; CNTV, 2012b) points out that the average television consumption time by children between 4-12 years is 4 hours a day. This figure means that they practically double the time of European children, although the most worrying fact is that 78.2% of them watch television programs for adults. Several authors have pointed out that access to inappropriate contents can result in behaviour problems due to the lack of appropriate topics and structures and the minor's low level of maturity and lower capacity for assimilating contents.

The use of video games is very extensive among children. Video games are multi-platform leisure programs (for computers, mobile phones and consoles) (García & Bringué, 2007), where the variety of narrative structures and interactivity schemes allows the user to adapt the game to their rhythm and style (Rangel, Ladrón-de-Guervara, Goncalves & Zambrano, 2011). This is precisely what has allowed children to access video games at an early age, as research by (Lloret, Cabrera & Sanz, 2013) shows: in Spain, 90% of children between 6 and 9 years of age play video games. In Chile, 57% of children have this hobby (Bringué & Sádaba, 2008). Regarding sex and age of Chilean «videogamers», research by (Bringué, Sádaba & Tolsá, 2011) concludes that 70% of children are already users at the age of 6, with no difference in sex. Between 7 and 10 years, that figure increases in boys and decreases in girls. It is important to point out that this activity promotes the acquisition of digital competencies, which favours the link with the educational context. Some researchers (Rojas, 2008) warn that video games have a certain amount of violence and that a continuous exposure to it might lead to increase of hostility and aggressiveness and lack of empathy. However, maybe different variables are responsible for the increase in aggressiveness.

Finally, in the last few years, mobile phones have become part of children's daily lives: «In Europe, one out of three mobile phones are in the hands of a

minor. In Spain, half of the children between 11 and 14 years of age have a mobile phone» (García & Bringué, 2007:111). A transnational study carried out in Japan, India, Indonesia, Egypt and Chile (Livingstone, 2013) shows that 65% of minors between 10 and 18 years of age have access to a mobile phone, 81% owns a new mobile phone and 20% owns a «smartphone». In Latin America, more than half of children between 6 and 9 years of age is a mobile phone user (Bringué, Sádaba & Tolsá, 2011). In Chile, researchers established that children have their first mobile phone at approximately the age of 10. However, between 6 and 9 years, they already use them, mainly to play and talk, with similar percentages in boys and girls (Bringué, Sádaba & Tolsá, 2011; Livingstone, 2013). It is clear, therefore, that Chilean children start using mobile phones at an early age. Accordingly, it is fundamental that adults promote a responsible and safe use of these devices to avoid risks such as addiction, cyber bullying, «grooming», «sexting», among others.

1.2. Parental mediation and ICTs

The massive use of ICTs during the last decade has caused a number of social changes, as can be seen in the denominations that our current generations receive in literature: digital natives, «e-society», «touch» generation or «multi-screen» generation (MacPake, Sthepen & Plowman, 2007; Prensky, 2011). These minors have grown up using ICTs, whereas adults have learnt on the fly, which has caused a digital gap between both generations. Probably, the lack of knowledge about the effects of using ICTs is the cause of the little concern in some parents, who just supervise the time and obviate contents that would require parental mediation (Garitaonandia & Garmendia, 2009; Garmendia, Casado, Martínez & Garitaonandia, 2013; Livingstone, Haddon, Görzig & Ólafsson, 2010). Research carried out in Chile (Bringué, Sádaba & Tolsá, 2011) shows that 50% of children declare being asked by their parents about their online activities and 36% of them consider that they are being watched by their parents as they surf the Web. The activities which are more frequently forbidden are online shopping (47%) and giving personal information (46%). Chatting, downloading files and playing were forbidden for 7% of the children and accessing a social network was forbidden for 3% of the children surveyed. Parental mediation is very important because parents establish security and responsibility criteria for an appropriate use of ICTs and they play a role in the development and acquisition of adequate behaviours in the use of these technologies (Livingstone & Helsper, 2008).

> Due to its importance in cognitive development, we propose here parenting schools that promote training in the appropriate use of technologies with a safe, ethical, integrative and responsible way, so that children's times in front of a screen can be controlled and the contents they access can be supervised.

2. Material and method

2.1. Sample selection and research instrument

The sample is intentional and the sample size is N=422 (50.5%, 49.5% female) between 9 and 12 years old, with an average of 9.8 years of age and a typical deviation of 0.906 years. The average in males is 9.86 years of age, with a deviation of 0.903. In females, the values are 9.74 and 0.878 respectively. They are pupils in the 4th, 5th and 6th years of Primary Education in 5 private schools in Santiago de Chile.

A survey was used to collect the following data: socio-demographic data (age, sex, year, school); how children between 9 and 12 years of age use ICTs (weekly frequency, place, time and what company they have while using them); how they perceive parental mediation when using ICTs (times, activities and risks).

2.2. Design

This is an exploratory study of empirical-analytical type, where an ex post facto descriptive methodology by survey has been used.

The survey was checked for reliability before being applied. The reliability test was α=0,87, and therefore, considered satisfactory. The survey was validated by two specialists and it was conducted among

30 children in order to modify the items that lead to error. The definitive version was conducted during the 2013 school year. Respondents answered the survey anonymously and with previous consent of their legal tutors.

3. Analysis and results

A descriptive statistical analysis with frequencies and percentages was carried out using the SPSS statistical software program (v. 21.0). In order to check independent variables (sex and age), the X2 test was applied.

Table 1. Children's use of ICTs

	Access the Internet		Watch television		Play video games		Use mobile phones	
	f	%	f	%	f	%	f	%
N=422	422	100	422	100	422	100	422	100
Use of ICTs								
Any day of the week	211	50.0	296	70.1	134	31.8	218	51.7
Only on school days	24	5.7	75	17.8	30	7.1	16	3.8
Only at weekends and bank holidays	139	32.9	28	6.6	127	30.1	43	10.2
I never do it	48	11.4	21	5.0	123	29.1	137	32.5
No answer	-	-	2	0.5	8	1.9	8	1.9
Place of use								
My bedroom	72	17.1	67	15.9	29	6.9	96	22.7
Living room	154	36.5	265	62.8	276	65.4	11	2.6
Brother/Sister's bedroom			4	0.9	12	2.8	1	0.2
Anywhere	167	39.6	80	19.0	19	4.5	193	45.7
I don't use it	28	6.6	2	0.5	82	19.4	119	28.2
No answer	1	0.2	4	0.9	4	0.9	2	0.5
Company while using ICTs								
On my own	246	58.3	154	36.5	143	33.9	248	58.8
With my mum and/or dad	40	9.5	30	7.1	2	0.5	19	4.5
With my brother/sister	60	14.2	208	49.3	118	28.0	13	3.1
With friends	24	5.7	1	0.2	36	8.5	11	2.6
With family or acquaintances	22	5.2	27	6.4	17	4.0	17	4.0
I never do this	29	6.9	2	0.5	98	23.2	98	23.2
No answer	1	0.2			8	1.9	16	3.8
Time spent using ICTs								
Over an hour	105	24.9	124	29.4	111	26.3	56	13.3
Less than an hour	146	34.6	125	29.6	125	29.6	90	21.3
Any time I wish	155	36.7	157	37.2	125	29.6	193	45.7
None. I am not allowed	4	0.9			36	8.5	61	14.5
No answer	12	2.8	16	3.8	25	5.9	22	5.2

3.1. Use of ICTs by children between 9 and 12 years of age

Table 1 shows the data provided by the sample regarding weekly frequency; place, company and time spent using ICTs. Results show that half of the children surf the Web any day of the week, over a third of the children connect from anywhere and that most of them access the Web without supervision. The small number of children surveyed that use the Internet accompanied by their parents is remarkable. Those who have no time restriction are about the same number as those who can log on less than an hour a day.

Regarding television consumption, most of them watch television any day of the week and this is done normally in the living room, mainly accompanied by brothers/sisters. The fact that 37.2% say that they can watch television as long as they wish is worthy of note.

On the topic of the use of video games, there are practically no differences between the percentages of those who play any day of the week, those who only play at weekends and bank holidays and those who never play. Most of them play in the living room and unaccompanied. Only two children play with their parents. Regarding daily use, results are homogeneous: 29.6% are allowed to play less than an hour and the same percentage is allowed to play as long as they wish. Mobile phones are used by more than half of the children any day of the week from anywhere and mainly without any time restriction. The fact that 32.5% declare that they do not use it is worthy of mention.

3.2. Perceived parental mediation while using ICTs

Table 2 shows the main results concerning how parental mediation is perceived by children. Half of the children surveyed indicate that they have no time constraints when they use the computer, surf the Web or watch television. Time limits are present, however, when they play video games. In other activities of their daily life (doing homework, sleeping, meals), most of them say they do have fixed times.

As regards allowed Internet activities, most of the children state that they are allowed to log on to social networks (Facebook), to upload pictures and videos, to download movies and music, to watch videos on YouTube, to be online for a long time and to play online video games. The forbidden activities are online shopping, filling in forms with personal details and contacting strangers.

These results show risk behaviours. Accessing social networks such as Facebook is one of these risks, taking into account that the subjects surveyed are all under 13 of age, which is the legally required mini-

mum age to create a profile in that website by filling in a form with personal details. Furthermore, it is very easy to contact strangers in this social network. The other activities allowed entail certain risks such as access to inappropriate contents (violence, pornography), giving away personal information, addiction or contact with strangers. Therefore, there is a contradiction that shows a certain lack of knowledge about the dangers that these activities imply in the children's lives.

As for television programs, most of the children surveyed indicate that they are allowed to watch programs at night, soap operas and the news. Forbidden programs are those with adult or highly violent contents. These results show a paradox, as programs allowed do have adult contents and show explicit or implicit violence in some cases.

Regarding parental mediation perceived while playing video games, the high percentage of children who are allowed to play on their own is worthy of note and also that more than half of the children say they do not have any parental restriction for violent games. Risky behaviours can be noted: 46.4% of the children have parental permission to play for a long time and 31.5% state that they are allowed to play with strangers online. On the other hand, most of the children state that they talk with their parents about the risks of ICTs, especially about the topic of contacting strangers.

3.3. Age and sex in the use of ICTs

To analyze the influence of «age» and «sex», Chi-square tests were conducted in contingency tables, which prove the association between the variables analyzed. If we selected «age» with four categories (9, 10, 11 and 12 years old) the requirements for the test (minimum expected values of less than 5 per cell) would not be met. To solve this problem, we group «age» in two blocks (9-10 and 11-12), although this creates categories with two ages and this will alter the true behaviour between the variables. Despite the fact it is a significant figure from a strictly statistical point of

Table 2. Parental mediation perceived when using ICTs

Have fixed times for the following activities	Yes		No		No answer		Total	
	f	%	f	%	f	%	f	%
Use the computer and surf the Web	201	47.6	208	49.3	13	3.1	422	100
Watch television	194	46.0	214	50.7	14	3.3	422	100
Play video games	209	49.5	190	45.0	23	5.5	422	100
Do homework	331	78.4	72	17.1	19	4.5	422	100
Go to sleep	335	79.4	68	16.1	19	4.5	422	100
Have lunch and dinner	365	86.5	38	9.0	19	4.5	422	100
Activities allowed by parents while surfing the Web								
Buy things online	85	20.1	324	76.8	13	3.1	422	100
Fill in forms with personal data	54	12.8	355	84.1	13	3.1	422	100
Log on to social networks (Facebook)	303	71.8	106	25.1	13	3.1	422	100
Upload photos and videos	247	58.5	162	38.4	13	3.1	422	100
Download movies or music	332	78.7	77	18.2	13	3.1	422	100
Watch videos on YouTube	378	89.6	38	9.0	6	1.4	422	100
Contact strangers	41	9.7	368	87.2	13	3.1	422	100
Be online for a long time	209	49.5	200	47.4	13	3.1	422	100
Play online	368	87.2	48	11.4	6	1.4	422	100
Watch programs for adults	86	20.4	323	76.5	13	3.1	422	100
Programs that parents allow them to watch on tv								
Watch programs at night	277	65.6	132	31.3	13	3.1	422	100
Watch soap operas	283	67.1	126	29.9	13	3.1	422	100
Watch the news	342	81.0	67	15.9	13	3.1	422	100
Watch violent programs	146	34.6	263	62.3	13	3.1	422	100
Activities allowed by parents while playing video games								
Play for a long time	196	46.4	213	50.5	13	3.1	422	100
Play on his/her own	372	88.2	44	10.4	6	1.4	422	100
Play violent games	220	52.1	189	44.8	13	3.1	422	100
Play pirated games	307	72.7	102	24.2	13	3.1	422	100
Play with strangers online	133	31.5	276	65.4	13	3.1	422	100
Conversation with parents about the dangers of ICTs								
Dangers of contacting strangers	329	78.0	45	10.7	48	11.4	422	100
Harm it causes you watching adult contents online	279	66.1	112	26.5	31	7.3	422	100
The need to contrast information online because not everything is true	247	58.5	117	27.7	58	13.7	422	100

Table 3. Summary of ICTs use with age variable			
ICTs	X^2	gl	Valor-p
I watch television	34.031	9	0.000
I play video games	34.809	9	0.000
I use a mobile phone	20.584	9	0.015
Place where I watch television	31.163	12	0.002
Place where I play video games	22.510	12	0.032
Company while surfing the Web	33.720	15	0.004
Company while using the television	29.358	15	0.014
Company while playing video games	47.634	15	0.000
Company while using the mobile phone	28.622	15	0.018
Daily time watching television	22.192	6	0.001
Daily time on the Internet	18.384	9	0.031
Daily time playing video games	17.918	9	0.036
Daily time using the mobile phone	57.104	9	0.000
Activities parents allow them to do while surfing the Web (logging into social networks like Facebook)	11.709	3	0.008
Activities parents allow them to do while surfing the Web (watching videos on YouTube)	8.668	3	0.034
Activities parents allow them to do while surfing the Web (playing video games on their own)	15.022	3	0.002
Argue with their parents about time allowed to play video games	7.426	3	0.059
Argue with their parents about time allowed to watch tv	14.771	3	0.002
Argue with their parents about time allowed to use the mobile phone	32.473	3	0.000

view, 53.5% cannot be considered as representative. Significant results should be greater when the sample increases.

When doing a crosstab between variable «sex» and the results obtained in ICTs, 96.0% of them show no significance. However, we appreciate a certain significance in the activity «watch videos on YouTube» [(□2=4.170; GL=1; p=0.041)] and the perception of digital skills that they consider they have in comparison to their family, friends and teachers [(□2=8.056; GL=3; p=0.045)]. Significance in the case of males is slightly greater than in the case of females.

4. Discussion and conclusions

According to our analysis of how children use ICTs (frequency, place, company and time), most of the children surveyed have access to the Internet, half of them access the Web any day of the week and more than a third do that from anywhere. Compared to previous years, this shows a change in the place of access that can be explained due to the massive proliferation of 3G devices, which provide ubiquity and hyperconnectivity, important characteristics of children of this generation. Regarding the company they have while surfing the Web, 58.3% state they do it on their own, only 9.8% are accompanied by their parents while they are online and 36.7% has no limit to be online. We can appreciate that there is a risk in children using the Internet without parental supervision (Casado, Martínez & Garitaonandia, 2013; Livingstone, 2013).

Regarding television consumption, results show that 70.0% of the children watch television any day of the week, although is important to point out that this activity takes places mainly in the living room and they are accompanied, mostly by their siblings. If the television is in a common space and they are accompanied there are less probabilities that they may have access to inappropriate contents. However, 37.2% state that they watch television as long as they wish, which is coherent with results from (CNTV, 2012a).

As regards mobile phones, results indicate that most children have a mobile device and more than half of them uses a mobile phone any day of the week from anywhere and has no time limit to use it. This corroborates data by (Bringué, Sádaba & Tolsá, 2011; Livingstone 2013), who insist on the need for parental supervision on the use of mobile phones due to the risky behaviours observed.

As long as perceived parental mediation in the use of ICTs is concerned, results point out that half of the children do not have specific times to use the computer, to access the Internet or to watch television. They do, however, have time limits when playing video games. Establishing fixed times for activities is a fundamental part of setting boundaries and, as well as helping in a better use of ICTs, it contributes to the prevention of risky behaviours.

As regards Internet activities allowed, the high percentage of children allowed to log on to social networks (Facebook), to upload pictures and videos, to download movies and music, to watch videos on YouTube, to be online for a long time and to play online video games is worthy of note. The forbidden activities are online shopping, filling in forms with personal details and contacting strangers. There is a paradox in the fact that despite the fact that children are not allowed to provide personal information or to contact strangers, most of them are allowed to use Facebook. The subjects surveyed are all under 13 of age, which is the legally required minimum age to create a profile in that social network by filling in a form with personal details. Furthermore, it is very easy to contact strangers

on Facebook. The other activities allowed entail certain risks such as access to inappropriate contents (violence, pornography), giving away personal information, addiction or contact with strangers. This information shows a certain lack of knowledge about the risks that these activities imply in the children's lives. Therefore, family dialogue should be encouraged to agree on the right times and places for use of ICTs and on the accepted digital contents, web services and people that can be contacted (Berríos & Buxarrais, 2005; Buxarrais, Noguera, Tey, Burguet & Duprat, 2011).

Concerning television consumption, children declare that their parents allow them to see evening programming, soap operas and the news, whereas adult and violent programs are forbidden. This coincides with data by CNTV (2012b).These results show a contradiction, as programs allowed have adult contents and show explicit or implicit violence in some cases. This lack of attention might lead to children's misunderstanding of what they are watching, experiencing strong emotions without expressing them or lack of a critical point of view towards the information received. The positive aspect is that most children surveyed watch television in common spaces, which facilitates supervision.

Most indicate that they talk to their parents about the risks of using ICTs such as contacting strangers, harm derived from watching adult contents or reliability of documents online.

According to the variables analysed (age and sex), in the four age rangesthere is no difference in the use of ICTs, although there is a link between age and use. For television and video games, space is generally closely linked to common areas of the house. When using each device, there is a correlation with age, use and company. They use ICTs mostly on their own. No significant differences were found between males and females either in use of ICTs or in how children perceive parental mediation. This contradicts previous research by (Bringué & Sádaba, 2008; Bringué & Sádaba, 2009; Bringué, Sádaba & Tolsá, 2011).

We can appreciate that ICTs are part everyday life for most of the 9-12 year-old children surveyed. The Chilean interactive generation surpasses the average of other countries in the region, due to the access to all technologies (Bringué & Sádaba, 2008). There is no doubt that this is a generation with early access to the technological world (Aguaded, 2011): at pre-school age, they already have access to ICTs at home (Plowman, McPake & Stephen, 2010; Plowman, Stevenson, Stephen & McPake, 2012; Plowman, Stephen & McPake, 2012; Lepicnik & Samec, 2013). Due to its importance in cognitive development, we propose here parenting schools that promote training in the appropriate use of technologies with a safe, ethical, integrative and responsible way, so that children's times in front of a screen can be controlled and the contents they access can be supervised.

The main limitation of this study is that the research instrument was applied only in private schools of high socio-economic level. Therefore, results could hardly explain the reality of stat e schools and publicly-funded private schools, mainly due to the social segmentation present in Chilean education. As a prospective expansion of the research, the survey will be conducted with children from state schools, publicly-funded private schools and private schools to establish a comparison between all three realities. Also, a qualitative section will be incorporated to take into consideration families and teachers.

The study shows innovative contributions regarding the children's perceptions concerning parental mediation in the use of ICTs within the Chilean context. Being an exploratory study, it is only an initial study of this topic.

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Children's Exposure to Advertising on Games Sites in Brazil and Spain

Exposición infantil a anuncios en webs de juegos de Brasil y de España

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ABSTRACT

The online space is rich in playful experiences and can provide many pleasures and lessons to their younger users. However, it is true that children cannot always handle the advertising noise and other adverse effects resulting from excessive or inappropriate use of technology and particularly the game pages. This article aims to confirm the advertising pressure that affects children in Brazil and Spain when playing on Internet game pages. Measuring advertising pressure in online games by the theoretical and methodological framework for content analysis applied to the game pages visited by a group of Brazilian and Spanish children 9 to 11 years. This research showed that online games are occupied by a considerable amount of publicity, which repeatedly blocks access and disrupts key moments of young players with unwanted or not interesting messages. Like in television programming we must put more attention on quality and the amount of ads in online playing. So if there is a concern with the commercial content of children's programming on television similar reasons demand prompt and adequate attention to those games pages. Abusive ads damage advertiser's reputation, affects gaming experiences and disturb the playtime. Game managers, advertisers, educators and families may use children opinions that are actually successful.

RESUMEN

El espacio online es rico en experiencias lúdicas y puede proporcionar muchos placeres y aprendizajes a sus usuarios más jóvenes. Sin embargo es cierto que los niños no siempre pueden manejar el ruido publicitario y otros efectos nocivos derivados del uso excesivo o inapropiado de la tecnología, y en particular de las webs de juegos. Este artículo tiene como objetivo confirmar la presión publicitaria que afecta a niños de Brasil y España cuando se entretienen en portales de Internet con juegos. Para medir la presión publicitaria en los juegos actuales se recurre al marco teórico y metodológico del análisis de contenido sobre una muestra de webs visitadas por un grupo de niños brasileños y españoles de 9 a 11 años. Esta investigación evidencia que los juegos online son obstruidos por una cantidad considerable de anuncios que repetidamente bloquean el acceso e interrumpen momentos claves con mensajes no deseados o sin interés para los pequeños jugadores. De la misma forma que hay una preocupación con el contenido comercial de las programaciones infantiles en la televisión, se espera una pronta y suficiente atención a aquellas webs de juegos que lesionan la imagen de los anunciantes, entorpecen la experiencia del juego y sobre todo afectan a quienes están formándose como ciudadanos antes que consumidores. Se comprueba que las opiniones de este grupo de usuarios son acertadas y relevantes para comunicadores, profesores y familiares.

KEYWORDS | PALABRAS CLAVE

Advertising, online advertising, advertising strategies, Internet, childhood, games, content analysis, digital skill.
Publicidad, publicidad online, estrategias publicitarias, Internet, infancia, juegos, análisis de contenido, competencia digital.

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1. Introduction and background

For years, research of effects driven by media has given consideration to the training and educational possibilities of the modernization of equipment and technological devices to separate ages or stages in audience reception. As the effectiveness of communication lies not in technology, but in the power of political and economic groups that - in spite of the changes in cultural industries - continue to control at least part of audience reception, it is necessary to maintain a critical perspective when continuing studies on the communicative impact of contemporary technologies.

Besides, critical studies are still less numerous than research on communication and audience (Martínez-Nicolás & Saperas, 2011). The importance of this research perspective has already reached institutional policies, such as the European Commission, that since 2002 has been highlighting the academic focus of technology and media to research of users' practices (Pérez-Tornero, 2010).

During the last decades, information and communication technologies have marked the production and spread of information and knowledge. The rhythm of the development of the cultural industries and the several stages in the idea of «being a child» can be distinguished: in the book world, in television or in nowadays mobile and portable communication world. This work connects with the receptionist research, but trying to expand reception to interaction as a more conscious and voluntary way that occurs differently in digital relationships experienced and expressed by their own users.

The notion of child education is as modern as the book but only in recent times and with the concept of school a certain conception of childhood with its own vital objectives has been made visible. With schooling, although somewhat hidden, there is also an adult and institutional colonization of the possible childhood involved (Ariès, 1981). The textbook –reading is aimed at teachers and only centuries later to the individual reception– expectations and values between lines are drawn according to each culture.

At the stage of media, a different childhood is conceptualized, particularly during the golden age of television. After the World Wars, five centuries after the invention of letterpress printing, an international review defines children through the Universal Declaration of their rights. But simultaneously, powerful media technologies consolidate their power: film, newspapers, radio and television stations. Starting from the mass dissemination of information through press, radio and television another idea of childhood that is more sensitive and less autonomous is being built. Unlike books, these mass media «tell it all». Contents that were never in school textbooks make television a «revealing secrets machine» for children education, as rightly noted by Meyrowitz (1995).

Now, due to reasons contrary to the criticism of the modern book, naturalism accuses technology again, particularly the audiovisual media, of the disappearance of childhood (Postman, 1982), or at least one of its utopian idealizations. Among so many interests, media research on the psychosocial effects of television on children is not simple. However, studies on violence, sexism and other abuses of power agree that this audiovisual medium has not distinguished itself for its educational role and effects with the turn of the XXI century (Pérez-Salgado, Rivera & Ortiz, 2010; Martínez, Nicolas & Salas, 2013).

Unlike books, children's television programming is produced, catalogued and evaluated as mere entertainment, but its contents sometimes compete directly with family lifestyles or the legal school curriculum. In the most benevolent treatments, it is recognized that television for children barely reaches the category of electronic nanny while the parents rest.

If textbooks hide other forms of childhood, and television makes it fade in dreams, in the harsh terms of Postman (1982), how will childhood look with video games? The burden of blame has been cast on the time uselessly spent in front of «TV», children's favourite entertainment and dominant among Western children from the last decades of the twentieth century and now shared with electronic games so far this century. In the field of academic and industrial research, macro studies confirm every year the penetration of technologies into the practices of North American children (Kaiser Family Foundation, 2010), European children (EU Kids Online, 2010) and Brazilian children (TIC Kids Online Brasil, 2013). In addition many other micro studies have been published, more qualitative and close to navigation and children's online interactions, such as those mentioned in this article.

While critical research is minority, the ethnographic approaches to children's groups and communities within reception studies are even fewer. So, there is still pending a sociology, an anthropology, etc. of digital practices in the current reality of mobile technologies, including tablets and other devices that multiply the possibilities of video games and consoles for group playing, beyond languages and cultures, with strangers, in virtual or augmented realities, etc.

Children breeze in throughout the global computer network, with some tighter controls at home and in

the classroom. From their very own words they declare that they feel freer in moments and spaces «just for them», displacing towards this audiovisual playful interaction –like unique and own practices– previous ways of reading and reception of TV content and, even more, editorial content on paper.

Muros, Aragon and Bustos (2013) agree that the youngest use video games and digital networks mainly for entertainment. On the Internet, they «talk for the sake of talking» or play« for the sake of playing». However, it must not be forgotten that, in the latest technological period of cultural industries, video games –online or offline– are still funded by direct sales and contextual advertising. With an increasing number of users and generating billions of dollars annually worldwide, video games are advertising businesses as well as entertainment media. Even during the economic crisis, in 2009, games totalled 823 million dollars in the United States (Puro Marketing, 2010). In Brazil, the combination of play and advertising, called «advergame» in 2011, reached three billion dollars (Campi, 2012). In 2012 in Spain, over 27 million euros were spent on promotional games (Infoadex, 2013). The American sector (ESA 2014) states that they expect to reach 7.2 billion in 2016. It is clear that behind the scenes of gaming –and the type of child socialization involved– there is a profitable market. Away from adults behind screens, children can access possible worlds. Several Internet advertisement formats can be found in this context, which are aimed at young consumers or purchase influencers, and also entertainment formulas for domestic economies.

A general prevention of excessive advertising pressure requires a more careful approach in the case of children. The business experience of the crisis in the media is showing that advertising saturation does not make them more sustainable. Advertising has shifted from funding media to spoil the perception and value of what now are saturated channels. It is a serious matter in any case, but in addition, among children the probabilities of domestication of technologies (Silverstone and Haddon, 1996), i.e., making alternative uses of the devices to escape the programming, are, in theory, lower. Children, eager to enjoy their favourite leisure time, allow the advertising price» in those seemingly free and safe games.

Both Brazil and Spain are missing a specific regulation on child advertising in games and, as a matter of fact, the recommendations coming from agreements and self-monitoring initially designed for the television industry are not being respected. Moreover, technologies, by extending access to information with portability and mobility, exponentially multiply the possibilities of communication with more people in very varied places and formats. From this technological context that changes advertising, Méndiz (2010) details that the advertisements receive replies, they hybridize with information and they integrate under entertainment formats. Advertising campaigns of major brands during the golden age of television can be viewed as historical remnants.

> We have to anticipate the knowledge of the persuasive intention of advertisements so that children can defend themselves from the arguments of the advertisers. Even though the advertisements on game sites nowadays are still not presented in an attractive enough way to children, the trend is moving towards more interactive and attractive products whose persuasive arguments children must be able to understand and value.

Since the turn of the century, communication on corporate sites creates infotainment pages in sections that are more interesting for its audiences. And among the most innovative formats, the hybrid «advergame» becomes established, a video game with an advertising purpose that through sponsoring and contextual advertising stands over traditional formats. The exploitation of brand placement in films and on television has been extended to video games as in-game advertising, which is only placed on previously designed audiovisual spaces. But «advergames» provide the qualitative difference of offering entertainment designed by the brand for better visibility and recall (Martí, Currás & Sánchez, 2012). Méndiz (2010) considers advertising in virtual worlds as another type of advergame. From that format called «virtual world advertising», products and brands provide the virtual realism embedded in

designed imaginary worlds that books or television of the most powerful creativity cannot reach.

To Martí (2010), the advantage of the association between advertising and games is the fact that, in the middle of an excess of traditional advertising formats, games have an entertainment value that serves as bait to lure consumers tired of a type of advertising that they do not hesitate to eliminate because of its annoyance. Works published later than González & Francés (2009) and Méndiz (2010) insist that the attraction of attention by such kind of advertising particularly facilitates communication with children. Children's ability for games should target and adapt to children the business information present in those spaces. But while children are still entering the world of consumption, advertisers in games could be practicing the most incisive strategies to build brand loyalty among children.

In order to adjust the analysis to the updating of advertising formats, the prominence of the product and the brand is stressed in «advergame», «in-game advertising» and «virtual world advertising». The analysis of advertising content on the Web is completed with the rest of advertising formats online reviewed by scholars and profesionales[1] that can be summarized in:

• Background: sets the background of the site.

• Banner: marks out a two-dimensional space with static or animated content.

• Button: rectangle that normally includes the name and the logo or symbol of the advertiser.

• Classifieds: small classic wording on classified advertising pages of print newspapers organized by category.

• Interstitial: intermediate window that opens when activating a link to another destination, it is usually displayed for a short time.

• Sponsorship: financial producer of a space that is generally related to the niche of the sponsoring brand or of interest for the target group of their services-products.

• Pop under: advertising window that opens in the background.

• Pop up: advertising window that opens up in the foreground covering the content that was being browsed.

• Skyscraper: type of vertical banner that takes up one of the sides when navigating the information on the page.

• Slotting fee: privileged positioning on the information page that has a higher price, with different sizes and format (it shows a superior economic power of the advertiser).

• Subset: it takes up a horizontal space that disappears vertically when browsing the information on a page.

• Superstitial: like a pop up, but only for a while or until a click hides the information. Unlike pop ups, it opens in the same window and not on a new page.

Given the interpretive horizon of the criticism of books, television and games, it is important to consider the evolution of reading and television reception until the current child interaction with electronic devices. Professional and industry reports have been taken into account, but for this academic research, children's subjective opinion is preferred to select game spaces in both countries. As in other cases, this field of study can be an effect of global campaigns or a conscious and fully voluntary preference from the minors. But it is from their observation and interviews that the advertisements are taken. The idea is not studying the channels nor the advertisers with the intention of confirming some kind of effect. It consists on assessing children's judgement on the communicative and in-game effect of advertisements on their usual gaming portals. For a thermostatic education, as proposed by Postman (1984), advertising levels should be counteracted with specific actions in families and in schools, but also in game portals and businesses. In addition to fostering digital critical capacity in children, the intention is to examine how they are able to evaluate and manage their preferences and values (Martínez, Nicolás & Salas, 2013).

2. Materials and methods

In our previous study where we observed and interviewed groups of Brazilian and Spanish children between nine and eleven years old, we noted the value that children attach to these online games and what opinion they have on advertising (Uchoa-Craveiro & Araujo, 2013). In the age range of less than 12 years old, according to Te'eni-Harari, Lehman-Wilzig and Lampert (2009), skills and abilities for critical reception of advertising messages are formed. Thus, the sample and the age choice in two countries that are away from each other but united by the Internet. On the game sites that they suggest we researched the format and pressure of the advertisements found.

The focus is directed at advertising content visible on game pages that 20 Brazilian children and 29 Spanish children can access in a classroom with computers. These children are observed and interviewed during one free hour at school. In view of their reactions, objections and suggestions (Uchoa-Craveiro & Araujo, 2013) the opinions of 9-11-year-old children

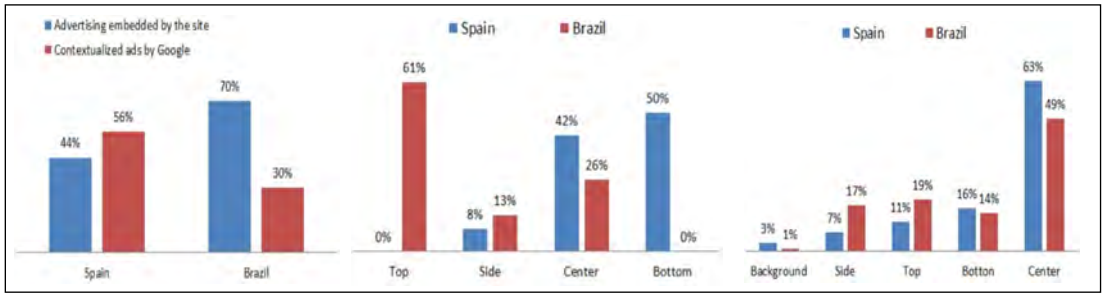

Chart 1. Distribution of advertising.

Chart 2. Position on the screen of ads by Google.

Chart 3. Position on the screen of self-managed website ads.

of both countries are compared to messages and advertising formats that appear on the portals where they play. Among the sites visited by children in Brazil and Spain, there are virtual worlds, social networks, portals and sites containing a single game. We have removed the pages that were visited by a single child due to representation. The Spanish sites that were analyzed are: juegosdechicas.com, juegosjuegos.com, habbo.es, akinator.com, ciudadpixel.es and clubpenguin.com. And the Brazilian game sites suggested: clickjogos.com.br, iguinho.ig.com.br, stardoll.com.br and clubpenguin.com.br. Both small groups indicate very well-known game spaces.

For content analysis, we have followed the conventional descriptions by Bardin (2004) and Piñuel (2002) with which we quantify the presence, the formats of presentation and frequency of advertisements on game portals used by groups of children. Among the data of the analysis sheet for each advertisement the following aspects are registered: origin of the distribution of advertising, whether it has been embedded by the site or it has been placed by Google as contextualized exposure during navigation.

- Position and space requirement of the advertisement on the screen according to templates.
- Type of format according to the professional advertising name mentioned in the previous section.
- Global or national character of the advertised brands.
- Levels of interaction of the advertisements: low, medium (one click, moving to another page, watching a few seconds of a video, etc.) or high, interactive and immersive.
- The general or specific and thematic nature of the ads displayed.

3. Analysis and results

In total we have analyzed 158 advertisements on Spanish game websites and 126 on Brazilian sites. Chart 1 shows more self-managed publicity on Brazilian's pages; whereas game pages used in Spain have more contextual advertising by Google.

Contextual advertising suggests that Spanish children see advertisements that are more related to their personal preferences or recent searches. On the other hand, direct management and charging of Brazilian advertising suggests more independence when it comes to financing game websites.

According to the complaints expressed by children, an aggressive advertising that invades the centre of the screen prevails. Charts 2 and 3 confirm that in both countries the game is interrupted by ads.

In table 1 (see table in next page), a more detailed analysis of the formats shows that contextualized advertisements by Google are less intrusive: banner (55% in Brazilian pages and 50% in Spanish sites), slotting fee (29% in Brazilian sites and 25% in Spanish sites), subset (3% for Brazilian spaces and 25% in Spanish pages) and classified advertisements that are only distributed on Brazilian portals (13%). The formats that girls and boys feel more uncomfortable with (pop-up, superstitial and interstitial) are not among the sponsored ads. A success in advertising management and beneficial to children's gaming in portals indirectly funded by Google's contextual advertising.

However, as shown in table 2 (see table in next page), publicity managed by gaming websites does not defend a quality experience in their games. Adding pop-under, superstitial and interstitial, 24% of advertisements are considered intrusive in Spanish sites. In Brazilian sites those are 19% of the advertising displayed. According to children's opinion, it is confirmed again that half of the advertising displayed in online games interrupts gameplay and devalue the experience.

In this utilization of advertising funds, it is surprising the low use of «advergame», which includes a relative «pact of interaction» as it is played on a stage that children recognize as advertising.

Figure 1 presents the «advergame» in Brazil's Click

Table 1. Types of ads by Google		
AD TYPE	BRAZIL	SPAIN
Banner	55%	50%
Classified	13%	0%
Slotting fee	29%	25%
Subset	3%	25%

Jogos, advertising of the juice brand Ades, which enhances the gaming experience by giving away a box of juice as a prize after some challenges. The evolution of product placement facilitates a more positive perception, communication and childhood memory of brands.

There is a significant difference in virtual world advertising, absent in the selected Brazilian games while, instead, it is the fifth preferred format on Spanish pages, surpassed only by superstitial and slotting fee advertisements. An example of virtual world advertising appears on the Spanish website Ciudad Pixel. As seen in figure 2, an entire room of Ciudad Pixel has been decorated with several objects with the brand Facebook approaching the brand experience to the context where it is displayed.

Table 2. Types of ads managed by the own sites		
TYPE OF AD	BRAZIL	SPAIN
Advergame	1%	0%
Background	8%	1%
Banner	35%	10%
Button	9%	12%
Interstitial	4%	0%
Sponsorship	0%	4%
Pop-under	1%	3%
Pop-up	0%	0%
Slotting fee	26%	26%
Subset	1%	1%
Superstitial	15%	24%
Virtual world advertising	0%	19%

Both advergames and virtual world advertising are better suited formats to the current advertising paradigm with a tendency to offer consumers a playful brand experience (Méndiz, 2010). More than information about the product or service, they are formats that allow user identification with the brand. Their absence in game spaces wastes the competences that the younger players may wish to voluntarily exercise in them.

In terms of general or specific nature of the advertisements analyzed, it is surprising the pragmatic and self-interested advertising management in these game portals, with a majority of generic advertisements, both in the Brazilian programming (74%) and the Spanish (54%) one. They are generic and not directed at children playing in them (chart 4). The fact that very few are advertisements aimed at children playing in them (chart 4) misses a native targeting of children practices.

An example of advertising aimed at children is the type «virtual world advertising» which appears in the virtual world Habbo. Figure 3 shows that the advertisement publicizes the product Cheetos of the brand Elma Chips through vending machines and pushcarts scattered throughout the virtual world. The users of the game, through their avatar, could pick up a package of Cheetos and pretend to eat it. Buying and eating are expected actions of avatars in these games, which facilitates the advertising strategy used in the example. Because of its perspective, but also because of its shape of pet, Chester Cheetah is an advertisement aimed at the users of a game. This advertising suggests and gets a more emotional, playful and direct communication with their interlocutors: children.

In the playing field of gaming, interaction is still untapped by advertising. Besides, there is some correlation between the level of interaction and the appeal of an advertisement. The results in figures 2 and 4 suggest that interaction can reach further and with more sense than the imperative and emotions given by other types of advertisements. However, chart 5 confirms that high interactivity advertisements are not the majority on the game pages reviewed.

It is also proved, in line with the general advertising studies cited in the introduction, that multinational advertising dominates the industry of online games. Only 4% are Spanish advertisers and 11% are Brazilian companies. Despite the dominance of international advertising in children's games in this sample, only Disney, Google and Apple coincide as global brands in both countries.

In short, chart 6 points out that the ones who finance games chosen by girls and boys aged 9 and 11 during a gaming experience conducted in Brazil and Spain are multinational advertisers.

4. Discussion and conclusions

Gaming is the star of pre-teen children's entertain-

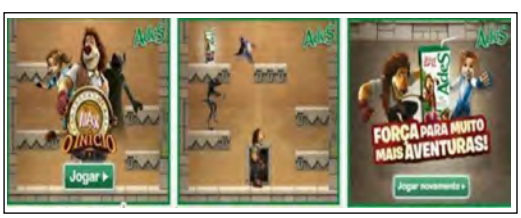

Figure 1. Example of «advergame».

Figure 2. Example of «virtual world advertising».

ment. Beyond advertising pressure on television, children can spend more than one third of their leisure time in advertising or trying to avoid them. Few are instructive, fun and almost none is interactive. Two groups of Brazilian and Spanish girls and boys under 12 recognized gaming websites and complained about intrusion and advertising saturation (Uchoa-Craveiro & Araujo, 2013). Having reviewed opinions and games, it is found that during that time, media children can be even more influenced no matter how much we speak of interactivity.

As their users themselves say, misdirected and inappropriately managed advertisements are an uncomfortable companion in online games for children. At least just as we are concerned about commercial content in children's television programs and series, particular attention should be given in a professional and quick manner to advertising communication on game pages that repeatedly blocks access to the game chosen and that interrupts key moments with unwanted messages which are often out of the interest of young players.

Screens have got smaller and into our pockets, so distinguishing formats by the space and time they take represents an analogue management of digital devices. Except in the case of advergames and virtual world advertising –which could confuse younger users– there is little formal and conceptual update in the publicity use of the revised games. The views of young users of online games are of interest to publicists and managers of websites whose users are children. Interaction keeps being an unfinished business in communication, even in its form of entertaining programming. Like any other unmet user experience or demand for entertainment, ignoring opinions and suggestions of users simply because of their age results in commercial and media loss.

Beyond a presentation that is worthy or technologically appropriate for a digital context, this work has to emphasize the huge amount of advertisements and time consumed in one hour of online play. The reception of so many advertisements is very difficult and the playing time is halved because of disruptions and

Figure 3. Example of targeted advertisement.

annoyances that in many cases do not even interest or affect them.

More elaborate and expensive games deserve further reflection, like games on virtual worlds pages due to the amount of clichés and stereotypes of consumer society[2] that get active around the accumulation of virtual currency. Buying items/accessories for their avatars with this money generates differentiation among users making children pre-consumers. In addition to the fact that the scenario of this type of page makes it

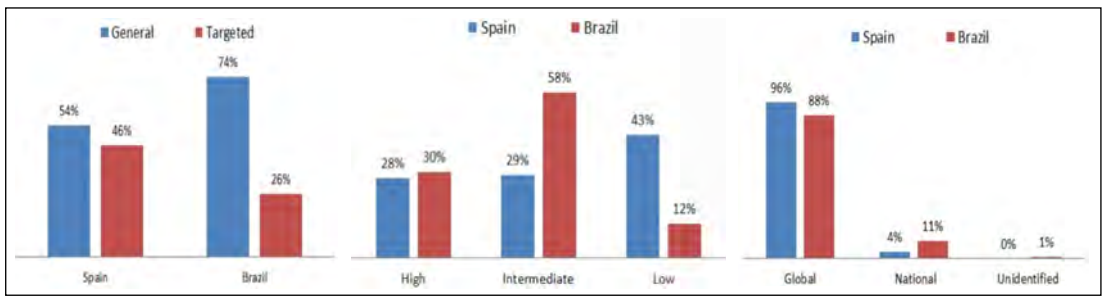

Chart 4. Generalist or targeted nature of the ads.

Chart 5. Level of interaction of advertisements.

Chart 6. Global or national character of the advertised brands.

harder for children to recognize the advertising intention of some information, kids are conditioned by the promotional aids that are being offered at different levels of those games that they clearly prefer and enjoy.

As in the case of other digital spaces for adults, it is confirmed that most of the pages from Spain and Brazil requested personal data about their child users. Giving away this data provides richer game experiences and, theoretically, it would offer a more personalized advertising. Through their privacy policy, game pages inform about whether they use user data to guide users and personalize advertising. Nevertheless, this quasi-contract comes in long texts and with the use of technical language that is difficult to understand even for an adult.

This analysis validates that the online space is rich in recreational experiences and can provide enjoyment and learning to their younger users. However, it is confirmed that they can not handle so much and so disparate advertising noise whose effects in the best of cases reduce play time and worsen their experience. Still pending more precise regulation and better ethics and corporate commitments, it is important to note that educators and parents should take a more active role in the entertainment and informal education of minors. Mediation of adults must surpass the model based on controlling the time children spend playing or the use of the content of the advertising that appears on game sites. As suggested by previous studies (García-Ruiz, Ramirez & Rodriguez-Rosell, 2014; Bujokas & Rothberg, 2014), it is essential to develop media literacy in order to establish acceptable levels of digital skills and promote the shaping of citizens with a marked critical-constructive character. Specifically, we have to anticipate the knowledge of the persuasive intention of advertisements so that children can defend themselves from the arguments of the advertisers. Even though the advertisements on game sites nowadays are still not presented in an attractive enough way to children, the trend is moving towards more interactive and attractive products whose persuasive arguments children must be able to understand and value.

Last but not least is the theoretical justification of advertising as financing and support of information and entertainment on the Internet. If advertisements are really intended to serve as the economic base of the «free» space on the Internet, they have to adjust to the times and game skills and in no way hinder or complicate the game experience. A possible quality marketing communication should not only preserve and disseminate a brand image. As communication, it should be respectful with the children that are active subjects of reception and interaction. At this stage of their educational period, perception and values are also developed. The brands that attack children's experience, no matter how visible and noticeable, may be losing reputation. Critical training is of interest to the children's environment, including advertisers and publicists. Advertising communication and games that befit our times help avoid damage to players as well as loss of reputation and investment resulting from obsolete business and communication models.

Notes

[1] The definitions of the types of ads are based on the works of Brandão and Moraes (2004), Carniello, and Assis (2009), Northeast (2009) and Sebastião (2011).

[2] Authors like Baudrillard (1998) and Bauman (2007) argue that postmodern society is a consumer society in which the individual is seen as a consumer. In this type of society, the exercise of consumption is something that is standardized and shapes relationships between individuals.

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Telecommunications Industry Contributions to Child Online Protection

Aportaciones del sector de telecomunicaciones a la protección en línea del menor

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ABSTRACT

The technological landscape in relation to the minors presents numerous challenges facing the telecommunication industry, with families and schools. However, academic literature still remains silence in showing the strategic policies that the industry is managing in order to address these challenges. Therefore, this article has two aims: to provide an overview of the state of the art in order to present the main findings of the child protection policies in international telecom companies (17), stressing the analysis regarding their products and services and how they manage the collaboration with key stakeholders. Research was conducted using qualitative methodology: CSR reports and websites of the companies were analysed in order to define their strategic actions, as well as the individuals and institutions that collaborate. The findings show interesting insights, even with some differences by regions, among the most significant policies pursued by the sector are: self-regulation, product innovation regarding protection tools and a network of collaborations with stakeholders have been established, as an opportunity for facilitating new policies and strategies. In conclusion, telecom industry needs to integrate their policies regarding minor protection, promoting an integral management approach that comprises not only product development but also strengthen relationships with the main stakeholders as parents and institutions.

RESUMEN

El paisaje tecnológico de las pantallas en relación al menor apunta a numerosos desafíos que la industria afronta junto a las familias y al sector educativo. Sin embargo, hay poca bibliografía que ahonde en las políticas estratégicas que está implantando el sector para hacer frente a estos retos. Por ello, este artículo tiene dos objetivos: en primer lugar, realizar una síntesis del estado de la cuestión para, seguidamente, presentar los principales hallazgos sobre cómo están afrontando este panorama las 17 principales empresas internacionales en su política comercial y en su relación con grupos de interés. La metodología aplicada es de carácter cualitativo, y analiza los informes de responsabilidad social y webs de las compañías, con el fin de identificar las líneas estratégicas y acciones empresariales, así como las personas e instituciones con quienes colaboran. Los resultados muestran que, pese a algunas diferencias entre regiones, el sector se atiene a un interés por la autorregulación, la innovación en los productos, en las herramientas de protección, así como en el mantenimiento de una estrecha red de colaboraciones con grupos de interés, que permite retroalimentar las políticas y estrategias. De este análisis se concluye que el sector necesita integrar las políticas de protección al menor no solo con el desarrollo de productos responsables, sino estrechando aún más los vínculos con grupos de interés clave como padres e instituciones.

KEYWORDS | PALABRAS CLAVE

Minors, online protection, telecommunication, strategy, services, products, responsibility, technology.
Menores, protección en línea, telecomunicaciones, estrategia, servicios, productos, responsabilidad, tecnología.

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1. Introduction and Background

Children and teenagers are growing up in a connected world where screens –Internet, videogames and cell phones– have taken on a greater importance. This technological panorama shows us millions of minors with screens in their pockets, giving them permanent access to contents that they themselves can create for their own and shared use.

In spite of the novelty of digital technology, it is true that the relationship between minors and the media has always attracted the attention of academics. In the 1930s we find the first research into cinema and radio, better known as the «Payne Fund Studies», which evolved towards television in the 1950s (Wartella & Reeves, 1985). At the beginning of the new millennium, the traditional media –radio, television and press– were joined by smart phones, tablets and videogame consoles. In parallel, interest in research has continued to grow by offering different approaches which, simultaneously, cover a wide range of media and technologies. Following the classification used by Bringué & Sádaba (2008), there are three major subject groups dealing with the relationship between minors and technology: consumption patterns, effects of use and legislative development.

The first of these analyzes the access and consumption of the child and teenage population groups (Colás & al., 2013; Tolsá & Bringué, 2012; Bringué & Sádaba, 2011, 2009, 2008; Sádaba, 2014, 2008; Rideout & al., 2010; Staksrud & al., 2009; Lenhart & al., 2008; Hasebrink & al., 2008). These studies describe quantitative aspects such as the technological equipment in homes, place of access, moment of access and time spent, together with the influence of socio-demographical variables such as sex, age and socio-economic status. There are many studies on the consumption of traditional media and new technologies (Rideout & al., 2005) and minors' attitudes towards them (Jones & Fox, 2009; Livingstone & al., 2010; Lenhart & al., 2005). Particular international relevance has been given to the projects «EU Kids Online I and II» coordinated by Sonia Livingstone (Livingstone & al., 2013; D´Haenens & al., 2013; Livingstone & al., 2012) and those carried out by the «Pew Research Center» in the United States (Jones & Fox, 2009; Lenhart & al., 2008, 2006).

A second group of work delves deeper into the effects of these technologies (Byron, 2008; Livingstone, 2009), with special emphasis on the negative and positive consequences shown as risks and opportunities. The typology proposed by Livingstone & Haddon (2009) classifies three risks: contents, contacts and conducts. Regarding the positive potential, they underline the benefits for education, socialization, learning, participation, promotion of entertainment, creativity and documentation (Middaugh & Kahne, 2013; Livingstone & al., 2012; Staksrud & al., 2009; Livingstone & Haddon, 2009; Janes & Fox, 2009; Byron, 2008; Hasebrink & al., 2008; Katz, 2006; Buckingham & Rodríguez, 2013).

Finally, in the studies on the development of legislation, which are focused on the protection of minors, according to Tolsá (2012), there are three key elements which are particularly relevant in this area: regulations, family mediation and media literacy. These studies aim to inspire measures to protect the physical and psychological integrity of the minor (Lunt & Livingstone, 2012). Carlsson (2006) highlights the importance of a system which combines regulation and self-regulation, taking into account that technology is advancing at an incredible rate and that current legislation may easily become obsolete. Most of the few studies on self-regulation analyzed, on the one hand, regulatory and legislative policies and, on the other, the operators' codes of conduct (Lievens, 2007; Ahlert & al., 2005). They are all aware of the constraints in the existing judicial solutions and advocate a common self-regulatory framework for the whole industry. As regards family mediation, the need for parents to control and accompany their children in this new digital reality is emphasized. The parental figure is of great importance to instill guidelines and habits for the use of these technologies (Llopis, 2004; Austin & al., 1999). Finally, the studies focusing on the spread of educational knowledge are a valuable resource for the promotion of responsible use (García Matilla, 2004; Buckingham & Domaille, 2003).

In this third field of regulatory studies, only limited attention has been paid to the role of the telecommunication companies in spite of the fact that over many years they have proposed numerous self-regulation codes and policies concerning child protection. It is difficult to gauge how much of this is genuine or self-interested, although different international organizations such as the European Commission and the International Telecommunications Union (ITU) have insisted on the need for the collaboration and involvement of public authorities, the industry, education agents and civil society. Nor must we underestimate the contribution of the social context in ensuring that companies behave in a socially responsible way: this has been formalized in the development and consolidation of the areas of Corporative Social Responsibility. Whatever the case, and far from acting unilaterally, we see

that the operators have begun to develop multiple relationships with stakeholders such as schools, families, specialized NGOs, public authorities expert researchers and even communication media in an effort to contribute to the protection of children and teenagers in the digital world.

The interest of these companies in being part of this debate may be explained from the double perspective of social responsibility and market logic. Applying McNeal's classification (1987), the relationship of children and teenagers with ICT takes on a threefold dimension: present, future and influence. Present because they are users of 2.0 services, and create contents and use social networks and online games with great skill. The future dimension indicates that in a few years these users will be adults and potential customers for these services. Finally, their influence can be seen in family shopping decisions, for example, in the categories of products such as toys, food or entertainment and, without doubt, technology as well. These issues are not ignored by the marketing departments in the companies (Jiménez & Ramos, 2007), given that young people are a very attractive market for the operators. The European Commission estimates that in the future this segment will generate 30,000 million Euros (Clarke, 2005).

> Children and teenagers are growing up in a connected world where screens –Internet, videogames and cell phones– have taken on a greater importance. This technological panorama shows us millions of minors with screens in their pockets, giving them permanent access to contents that they themselves can create for their own and shared use. In spite of the novelty of digital technology, it is true that the relationship between minors and the media has always attracted the attention of academics.

However, this is a sensitive and vulnerable age group. Clarke (2005: 4) defines them as «our protected market». Their cognitive development is not comparable to that of an adult and, therefore, they are not always aware of the opportunities and dangers. Consequently, children may make improper use of contents or access contents which could harm them. However, we can also intuit a field of opportunities for a company which, as an expert in ICTs, has greater knowledge to reduce risks but also to make the most of innovation and of the development of tools as the bases for future business lines which will, then, become important means for generating income.

The complexity of acting on this age group, which is still dependent on the family and school, makes joint action necessary. In the words of Carlsson (2006: 14): «No one instrument of regulation is sufficient; today and in the future some form of effective interaction between all three kinds of media regulation –that is, between government, the media and civil society–. All the relevant stakeholders –within government, the media sector and civil society– need to develop effective means by which to collaborate».

From this perspective it is comprehensible that the International Telecommunications Union should intercede so that the public authorities by stimulating regulation, the NGOs– with educational aims, experts from research, and companies with their commercial offer, join forces in order to create responsible digital citizens. Simultaneously, national and international civil associations carry out extensive work for online protection. No less important is the joint action of the different agents in the ICT production line –operators, manufacturers developers or software companies– to develop and commercialize solutions which, apart from protecting children will also offer them tools to make the most of these technological opportunities.

In view of the combination of risks and opportunities, what the IUT (2009: 58) emphasizes takes on a new meaning: «Businesses must put protecting children at the heart of their work, paying special attention to protecting the privacy of young users' personal data, preserving their right to freedom of expression, and putting systems in place to address violations of children's rights when they occur. Where domestic laws have not yet caught up with international law, business has an opportunity –and the responsibility– to bring their business practices in line with those standards».

The answer to these questions demands a com-

plex approach taking into account not only the characteristics of children and young teenagers but also the market pressures, the social and economic nature of the companies together with the current technological acceleration. All of the above is faithfully reflected in the policies proposed by the sector. The objective of this article is to find and analyze the main action points of the companies in the sector on the subject of online protection of minors, in order to identify their strengths and the tendencies they have in mind.

The telecommunications companies are aware of their particular responsibility to lay down the foundations for a safe virtual world for children and teenagers. In this sense, collaboration and association within the industry are key points in the process. The agreements signed bring together the main representatives of the sector in order to share knowledge, initiatives and new tools for the protection of minors. But the telecommunications companies are only one piece in the jigsaw also made up of radio broadcasters, social networks, application creators, content developers and gadget manufacturers.

2. Material and methods

From an international perspective, this section shows the policies followed by different telecommunication companies. To do so, we have selected operators who have developed formal policies on the proper use of new technologies. As there are no earlier studies giving a list of operators regarding this topic, a theoretical focus group has been followed (Denzin & Lincoln, 1994; Visauta, 1989), not a statistical one. The following are the criteria which justify the selection of the sample:

Firstly, given that this is an international study and following a relevance criterion, we turned to the latest «Wireless Intelligence» report. It gives a list of the 20 telecommunications companies with the most mobile connections and the highest incomes in the world: China Mobile, Grupo Vodafone, Grupo América Móvil, Grupo Telefónica, China Unicom, Grupo Verizon Wireless, VimpelCom, Orange Group, Grupo Bharti Airtel, AT&T, China Telecom, Deutsche Telekom, Grupo MTN, Grupo Telenor, Grupo Telecom Italia, NTT DOCOMO, Sprint Nextel, Sistema Group, Telkomsel, au (KDDI) (Wireless Intelligence, 2014). However, not all of these have this type of policies, so some of them have been ruled out.

Secondly, to see their appropriateness for the aim of the research, from among the above companies we analyzed those that had signed some of the principal agreements for the sector. These are: «CEO Coalition to make Internet a better place for kids», «European Framework for Safer Mobile use by Young Teenagers and Children», «Safer Social Networking Principles», «Pan-European Games Information System», «Mobile Alliance against Child Sexual Abuse» and Principles for a Safer Use of Connected Devices and Online Services». For this reason, seven of these have been ruled out: Grupo América Móvil, China Unicom, Grupo Bharti Airtel, China Telecom, Sistema Group, Telkomsel, au (KDDI).

Finally, four additional cases have been selected due to their interest in this area: Yoigo and Ono, two Spanish companies which, although they have a smaller turnover, are developing important policies on minors; British Telecom which, although not included in the «Wireless Intelligence» report, is outstanding for its contribution; and Télmex, a Mexican multinational which in the last few months has developed important education programs. In short, following the three above-mentioned criteria, the sample is made up of the following companies: Orange, Vodafone, Telefónica, Deutsche Telekom, Telecom Italia, VimpelCom, Telenor, AT&T, Sprint Nextel, Verizon, NTT, China Mobile, MTN, Télmex, Yoigo, Ono y British Telecom.

The methodology used was document analysis of the reports of Corporate Social Responsibility (CSR) and of corporate websites over the last year. The latest available reports[3] 2012-13 and websites[4] date from

the period between February 2014 and April 2014. Both types of platform are considered by the experts to be the most frequently used for the reporting information on social responsibility in companies (Moreno & Capriotti, 2009; Kolk & al., 1999). Thanks to the richness of contents, data can be found on the most common corporative actions and the stakeholders: schools and educational institutions, types of authorities, most outstanding NGOs, commercial partners, awareness campaigns, etc. This information groups what the companies say regarding their protection programs, most of which comes from their CSR departments. The document analysis was carried out by means of a set of analytical-synthetic procedures on the subject-matter of the platforms (Yin, 2011; Weber, 1990). This was executed through a technical reading of the documents and the websites in search of the parts that reveal greater content on protection policies for minors and new technologies. Once the most significant topics had been identified, a set of content categories was applied to the analyzed material: (1) the strategic guidelines of each company: related with the strategic objectives pursued with these policies. As we have seen in the previous section, the relationship between minors and new technologies implies multiple challenges for the industry, from self-regulation to collaboration with social agents. (2) Actions within the strategic guidelines of the companies: projects and specific activities are developed which include the resources needed to undertake them. (3) Groups of interest: each type of action is addressed to a specific group of interest. Among them: the minors themselves, educators (parents, teachers and siblings), the ICT industry, public institutions, NGOs, civil associations, journalists and experts.

3. Analysis and results

The analysis of the main policies of the telecommunication sector in the area of child online protection takes into account the aforementioned companies listed in the following order: Orange, Vodafone, Telefonica, Deutsche Telekom, Telecom Italia Group VimpelCom, Telenor Group, AT & T, Sprint Nextel, Verizon, NTT Group, China Mobile, MTN Group, Telmex, Telstra, ONO and British Telecom. The analysis has been done according to three elements. First, the strategic lines of each company are specified in the short and medium term. These guidelines respond to substantial advances in technology to assess and respond to children's needs in the online world. Among them is how the ICT industry can help promote safety for children using the Internet or any technologies or devices that can connect to it, as well as guidance on how to enable responsible digital citizenship, learning and civic participation. The updated version provides guidance specifically aimed at companies that develop, provide or make use of information and communication technologies. Second, the actions that each company are developing to achieve their strategic lines are analysed. These include codes of conduct, systems to notify suspected online abuse, and how they drive innovative solutions and create digital platforms that can expand educational opportunities. Finally, we present the stakeholders involved and the partnerships, including governments, companies, civil society, parents and educators. The table can be viewed at the following link: http://goo.gl/KyoiTU.

As a result of this analysis five strategic lines may be drawn on the telecommunication sector regarding the online protection of children and teenagers:

1) Self-regulation. In its Recommendation 98/560/EC of 24 September 1998, the European Commission requires «promoting the voluntary establishment of national frameworks for the protection of minors and human dignity. This involves encouraging the participation of relevant parties (users, consumers, businesses and public authorities) in establishing, implementing and evaluating national measures taken in this domain» (European Commission, 2012b). Examples of this are the internal codes of conduct regarding the services and contents commercialized by the operator's brand which often extend to the contents of it suppliers. But perhaps what best guide the self-regulation of the industry are the sectoral codes. Also noteworthy regarding Internet is «CEO Coalition to make Internet a better place for kids» of December 2011, promoted by the European Commission, and in the area of cell phones the «European Framework for Safer Mobile Use by Young Teenagers and Children» of 2007. Other agreements signed by the industry are: «Safer Social Networking Principles, Pan-European Games Information System», «Mobile Alliance against Child Sexual Abuse» and «Principles for a Safer Use of Connected Devices and Online Service».

2) Products and services. This refers to the development of specific tools, most of which are for the protection of younger users. Outstanding amongst these tools are the systems that restrict access to certain unsuitable contents, together with limiters of time/use, shopping and online applications commercializing product packs which allow for personalized configuration. Also of assistance is the availability of helplines through which customers can complain about illegal contents.

3) Awareness and information. This may be the most important strategic line in European companies whereas some companies in the United States and Japan make more effort with the development of the above-mentioned tools. The International Telecommunications Union (2009: 17) defines the role of industry and families as «overlapping, but differing» and suggests «a need for a national-base and shared strategy to keep children safe online, that is capable of influencing and empowering both industry and families». Given that sometimes minors have greater skills, the industry invests in awareness and information programs which address teachers. The awareness programs hope to attract attention to the importance of spreading educational habits in the use of TICs.

4) Classification of contents. This is based on accepted national norms which are coherent with the methods applied in equivalent media, for example, games or movies. Traditionally, they are classified as mobile commercial content, that is, content produced by mobile operators or in collaboration with third parties. Nevertheless, given the problems in practice, some countries have committed themselves to establishing a dual system of classification with contents for adults only and general/other. Regarding illegal contents (pornography and violence against children), most companies offer a helpline for complaints.

5) Collaborations. A good example of joint effort is the grouping of associations and strategic agreements between companies and institutions. The need for different social agents to be involved is being accepted. According to Carlsson (2006: 12), children's disadvantage in front of media requires a higher involvement of all those responsible of their protection. The operators construct bridges with different public authorities –ministries, law enforcement agencies, local administration, etc., NGOs and civil associations, educational institutions, representatives of families, and expert researchers– with inter-sectoral agreements. Thus, all the companies tighten their links with the same groups of interest: parents and teachers, national and international public institutions, commercial suppliers and partners, other operators, NGOs and civil associations, journalists and experts. However, within these large groups, each firm is in contact with specific individuals.

4. Discussion and conclusions

We can see how the industry is adopting voluntary self-regulatory measures which show their permanent commitment to the protection of young people. The telecommunications companies are aware of their particular responsibility to lay down the foundations for a safe virtual world for children and teenagers. In this sense, collaboration and association within the industry are key points in the process. The agreements signed bring together the main representatives of the sector in order to share knowledge, initiatives and new tools for the protection of minors. But the telecommunications companies are only one piece in the jigsaw also made up of radio broadcasters, social networks, application creators, content developers and gadget manufacturers.

Nonetheless, for the moment, most of the industry's policies have been motivated by public institutions such as the European Commission or the International Telecommunications Union, with agreements which include some directives which must be obeyed by the signatory companies. For this reason, a certain uniformity can be found in the policies of the companies analyzed, especially amongst the European ones as they are limited by the lines marked by the European Commission.

Differences between regions can also be found. While the European telecommunications companies place great importance on policies regarding education and information, the analyzed American and Asian companies focus their protection policies on the product and service. More specifically, this means that whereas the former consider these programs as part of their Corporative Social Responsibility policies, the latter include this information in the customer business areas on their websites. However, the two perspectives should work together. Parents and teachers must be given the information necessary to understand how young people use ICT services in order to educate them to become responsible users. The literature points out that education and communication with the users are fundamental to guarantee an appropriate digital experience for children and teenagers. These education programs addressing parents deal with topics such as contents and services, inappropriate contacts and privacy management. However, awareness is only part of these policies as there is also a need for the development of products and services which from their very conception avoid risks for young people as much as possible.

All of the corporations that were analyzed have developed tools intended to minimize the dangers of use and, to a lesser extent, to advance the proper use of new technologies. This can be confirmed if we compare the number of instruments intended to minimize risks –content filters, access restriction, blocking etc.– to those intended to maximize the potential of

new technologies such as GPS tracking systems and tools for schools support.

In this specific area of children and teenagers, the challenges and opportunities spring from a common source: the use of these companies' services. Future research could analyze how this is managed within the companies. In this sense and a priori, it might be better to integrate these policies into organizational units dedicated to the development of products and services in such a way that their safe and responsible use would be included in the commercial offer. They could, in this way, avoid risks and create new tools from an area closer to the phases of conception and development of services. At the same time, their actions for the protection of minors should not share management with other areas of the Department of Corporative Social Responsibility such as investments in the community, employee volunteering programs or the environmental impact.

The development of these policies favors the industry itself as it promotes user confidence. This is not surprising since, in their preferences, the stakeholders express interest in features such as Web quality, coverage, and connection speed together with pricing, but also appreciate variables such as social responsibility and company commitment to the public, especially concerning children and teenagers.

Notes

[1] According to the European Commission media literacy is «the ability to access the media, to understand and to critically evaluate different aspects of the media and media contents and to create communications in a variety of contexts».

[2] For Freeman and Reed (1983: 91), «stakeholder» is «any identifiable group or individual who can affect the achievement of an organization's objectives or who is affected by the achievement of an organization's objectives».

[3] Corporative social responsibility reports, also called sustainability reports. Orange (2014a), Vodafone (2013), Telefónica (2013), ONO (2013), Yoigo (2013), Deutsche Telekom (2014a), Telecom Italia (2014a), British Telecom (2014), VimpelCom (2014a), Telenor (2014a), AT&T (2013), Sprint Nextel (2013), Verizon (2014), NTT (2014a), China Mobile (2014a), MTN (2014).

[4] Websites, a section dedicated to social responsibility, protection of minors. In the case of American and Asian companies customer area. Orange (2014b), Vodafone (2014), Telefónica (2014), ONO (2014), Yoigo (2014), Deutsche Telekom (2014b), Telecom Italia (2014b), British Telecom (2014), VimpelCom (2014b), Telenor (2014b), AT&T (2014), SprintNextel (2014), Verizon (2013), NTT (2014b), China Mobile (2014b), Telméx (2014).

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Information Literacy Grade of Secondary School Teachers in Spain – Beliefs and Self-Perceptions

Grado de alfabetización informacional del profesorado de Secundaria en España: Creencias y autopercepciones

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ABSTRACT

Information Literacy is one of the dimensions of digital competence and, in today's information and media-based society, it should be a skill that everyone develops, especially secondary school teachers due to their influence on this crucial stage of student development. In this investigation we aim to determine the current level of information literacy of secondary school teachers in Spain. For this purpose we have designed a questionnaire (n=2,656) which is divided into two parts: the first asks questions related to belief and self-perception of information literacy indicators, and the second presents practical cases in which the teachers have to demonstrate their skills in information literacy. The results confirm that secondary school teachers' beliefs show rather high values but that, even if the level of information literacy that the teachers have is acceptable, there are certain aspects of the indicators related to assessment, management and transformation of information in which the teachers display serious shortcomings. This highlights the need to establish a training plan for information literacy for secondary school teachers in Spain.

RESUMEN

La alfabetización informacional es una de las dimensiones de la competencia digital y, como tal, debe ser tenida muy en cuenta dentro de las competencias asumibles por cualquier persona en nuestros días, inmersa en la sociedad de la información y la comunicación, pero más concretamente por el profesorado de Educación Secundaria dada la gran importancia que tiene esta etapa en la formación de los alumnos. En este estudio hemos querido conocer cuál es el grado de alfabetización informacional del profesorado de Secundaria del estado español. Para ello hemos construido y aplicado un cuestionario (n=2.656). En dicho instrumento hemos sometido al profesorado a dos partes bien diferenciadas, una con cuestiones de creencia y autopercepción sobre los indicadores de la alfabetización informacional, y por otra, con cuestiones de situación, casos prácticos en los que el profesorado ha tenido que poner en práctica las habilidades y destrezas que tiene sobre la alfabetización informacional. Los resultados obtenidos confirman que las creencias del profesorado de Educación Secundaria dan valores bastante elevados pero también nos muestran que si bien el grado de alfabetización informacional del profesorado consigue el aprobado, hay ciertos aspectos de los indicadores relativos a la evaluación, gestión y transformación de la información donde los docentes tienen graves carencias. Todo ello pone de manifiesto la necesidad de plantear un plan formativo en alfabetización informacional del profesorado de Educación Secundaria de España.

KEYWORDS | PALABRAS CLAVE

Digital competence, information literacy, perceptions, training, secondary, indicators, ICT, teacher.
Competencia digital, alfabetización informacional, percepciones, formación, Secundaria, indicadores, TIC, docente.

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1. Introduction

Secondary Education is located on the border between compulsory education and university education or on the threshold of a specialised technical profession. In our education system, Secondary Education is one of the fundamental pillars on which the education of our students is based, and Secondary Education school teachers play a key role in the educational process. In this paper we focus on the competence of these school teachers. In particular we aim to determine what level of information literacy (a component of digital literacy) Spanish Secondary Education school teachers have. A profession such as teaching must have identity and competence (Sarramona, 2007). Competent teachers must have the ability to use Information and Communication Technologies (ICTs) skilfully in the classroom (Fernández, 2003). We currently speak about Secondary Education school teachers being immersed in a new role (Espuny & al., 2010; Gisbert, 2002; Tejada, 1999) that compels them to develop skills and abilities in the world of ICTs. Numerous public and private international institutions and organizations have attempted to define indicators to describe teachers' digital competence. These attempts have included efforts by the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2008) to set ICT standards for school teachers and work by the International Society for Technology in Education (ISTE, 2008). Numerous authors have also conducted research into the digital competences that contemporary school teachers must possess (Tejedor & García-Valcárcel, 2006; Suárez-Rodríguez & al., 2013). Some of these studies have focused on initial teacher-training (Ruiz & al., 2010; Roig & Pascual, 2012) while others have focused on continuous training (Cabero & al., 1999; Aznar & al., 2003). Other studies have analysed the beliefs and self-perceptions of Secondary Education school teachers regarding their use of the Internet in their classes (Ramírez & al., 2012) or their use of computers (Peinado & al., 2011). Digital competence comprises a series of dimensions (Vivancos, 2008). One dimension that recurs in every analysis of this basic competence is «information literacy» (IL).

Since the term «information literacy» was coined by Paul Zurkowski in 1974, several definitions of IL have been proposed. It is currently understood as the ability to treat information and to use this information to construct knowledge and lifelong learning in order to solve any problems we may encounter. This assumes the ability to recognise the need for information and know how to find it, analyse it, manage it and convert it into knowledge. Today, UNESCO is the international organization that most promotes information literacy in teaching institutions. It has established a curriculum for teachers (Wilson & al., 2011), attempted to establish indicators for this kind of literacy (Catts & Lau, 2008), and made numerous resources available for disseminating and studying it (UNESCO, 2013). Since possessing a certain level of IL is a fundamental need for both teachers and students (Wilson, 2012), we are interested in determining what level of IL Spanish Secondary Education school teachers have. Even though, as we mentioned earlier, previous studies have attempted to determine their level of digital competence, and even though studies on the information literacy of university students (Egaña & al., 2013) and the perceived information competence of future Secondary Education school teachers (Rodríguez & al., 2012) are available, no studies in Spain have been conducted on the level of information literacy of Spanish secondary school teachers. Although in different contexts to ours (Spain), the research on the IL of Secondary Education school teachers in other countries can provide examples and be useful for the purposes of comparison. Merchant and Hepworth (2002) compared the differences in the self-perceptions of IL levels between teachers and students in the United Kingdom. Smith (2013) analysed the self-perception of Canadian secondary school teachers with regard to their IL levels and the IL experiments they conduct in their classrooms. Williams and Wavell (2007) studied the perceptions that English secondary school teachers have of the IL levels of their pupils. Several studies on the IL levels of Secondary Education school teachers have also been conducted in South America. In Chile, for example, the Ministry of Education has established ICT competences and standards for the teaching profession in order to evaluate, among other things, how much their teachers have learned about strategies for searching, localizing, selecting and storing information resources available in electronic and online systems (Enlaces, 2011). The Colombian Ministry of Education has established five ITC competences for the professional development of teachers. With regard to IL, all of these competences, and in particular, research competence, emphasise the need for teachers to be able to: search, order, filter, connect and analyse the information available on the Internet; compare and analyse information from digital sources; and use information from the Internet critically and reflexively (MEN, 2013). In Spain, the National Institute of Educational Technology and Teacher Training (INTEF, 2014) has recently published a draft

report for a Common Framework for the Digital Competence of Teachers aimed at helping teachers to determine, develop, empower and evaluate their own digital competence as well as that of their pupils.

2. Material and methods

Having defined IL and discussed previous studies of IL in Spain and elsewhere, we now establish several IL indicators that will enable us to measure the extent to which secondary school teachers in Spain have acquired informational literacy. We have taken into account the above studies on indicators of digital competence as well as other indicators of IL: the UNESCO study, the study by Wen and Shih (2008), who sought to establish indicators of IL for primary school teachers and university lecturers in Taiwan, and the rules on IL indicators for future primary and secondary school teachers in the United States produced by the Instruction for Educators Committee of the Education and Behavioral Sciences Section (EBSS) (2011). Finally, to meet our objectives we also took as reference for our IL indicators those described by Larraz (2012) in the author's rubric for digital competence: recognize the need for information, locate it, evaluate it, organise it and transform it. We also analysed the various data collection instruments used in the numerous studies conducted so far in this area both in the general field of digital literacy (Covello, 2010) and in the specific field of IL. Since these instruments didn't fully convince us, we decided to construct and validate our own instrument, which is a questionnaire for measuring the level of information literacy of Secondary Education school teachers. In the following sections we present the first results of our research. We begin by assuming that, although the results for recognizing the need for information and locating information will be high, those for evaluating, organizing and transforming information will not.

2.1. Population and sample

The latest statistical data available from the Spanish Ministry of Education, corresponding to the 2011-12 academic year, shows that there were of 287,027 Secondary Education school teachers in Spain. Invitations to participate in the study were sent to every Secondary Education institution in the country and the questionnaire was available for online completion in 2013. A total of 2,656 valid responses were recorded. For this sample of 2,656 participants, the confidence interval was 1.9678, the sample error was 0.019, and the variability was 0.5. The characteristics of the sample are shown in table 1.

2.2. Instrument

To collect the data we used our self-compiled Secondary Education schoolteacher information literacy questionnaire (AIPS2013). This was based on the one used by Williams and Coles (2003) to measure the use and attitudes to IL of secondary school teachers in the United Kingdom, and the one used by the Digital Competence Assessment (DCA) research group of professor Calvani and al. (2010) to investigate the level of digital competence of secondary school pupils. We consider the interesting approach provided by the situation and practical case items of the latter questionnaire to be crucially important. Indeed, one of the objectives of our research was to investigate beyond the self-perceptions of teachers in order to obtain objective results for the true IL level of these teachers. Calvani also recognises that all Secondary Education school teachers should be able to meet the IL competency standards established in the suggested indicators for secondary schoolchildren, while Campbell (2004) concludes that the IL indicators are valid for all stages of human development.

The questionnaire is divided into two clearly distinct parts. In addition to questions aimed at identifying and describing the sample, the first part contains a series of closed questions on self-perception (Likert-scale questions), beliefs and attitudes regarding the indicators and the level of IL the teachers taking the questionnaire believe they have. The second part comprises questions on simulations or practical cases that test the teachers in order to obtain objective results for the indicators that will provide a more reliable estimate of IL levels. The questionnaire contains 13 descriptive questions and 32 questions on self-perception in the first part and 10 simulation/situation questions in

Table 1: Characteristics of the sample

Teachers	Total: 2,656 questionnaires received
	Gender: 44.5% male / 55.5% female
	Age: 3.2% between 21and 30 27.8% between 31 and 40 42.6% between 41 and 50 25.2% between 51 and 60 1.2% over 60
	Subjects taught: 23.2% Humanities and Social Sciences 28.0% Languages 42.5% Scientific and technological subjects 6.3% Artistic subjects
	Type of institution: 85% Public schools (state schools) 14% State-funded private schools 1% Private schools
	Teaching experience: 0.5% less than 1 year 9.5% between 1 and 5 years 15.9% between 6 and 10 years 74.2% over 10 years

the second part. The questionnaire can be found at http://goo.gl/57nst4.

Validation of this questionnaire involved an initial assessment by a committee of 10 experts comprising university professors of Educational Technology from several Spanish universities and Secondary Education school teachers. After relevant revisions and modifications had been made to the questionnaire, it was given to a pilot sample of 50 secondary school teachers in order to test reliability and detect any problems in understanding, accessing or using it. This first sample provided a Cronbach's Alpha reliability coefficient of 0.834 in the Likert-scale questions. According to Bisquerra (1987), values between 0.8 and 1 are considered excellent reliability indices. When the questionnaire was administered to our full sample of teachers, another excellent Chronbach's reliability coefficient of 0.811 was obtained. This demonstrates that our questionnaire was highly reliable. The data obtained from the questionnaire was codified and treated with version 21.0 of the SPSS statistical software package.

3. Results: Self-perceived information literacy (IL) level

Given the breadth of our questionnaire and the high number of responses recorded, in this first paper we will concentrate on the results from the questions on self-perception and the IL indicators. We will leave the evaluation and analysis of the practical questions for a future paper.

Teachers in Spanish Secondary Education have a high self-perception of their ability to recognize the need for information (indicator A). As we can see from table 2, the average percentage was 87.8% and in all cases the average scores exceeded 4.5. This means that Spanish secondary school teachers feel capable of searching for information on the Internet for work-related issues and locating the information they are seeking quickly and efficiently, and have no difficulty in identifying the objective, problem or reason for their search. Of these three concepts, the highest scores (mean=5.48; mode=6; and percentage=93.8) and least spread in the results (standard deviation=0.949) were obtained for finds information on the Internet for work-related issues. As we shall see later, these were also the highest scores of any question of any IL indicator. Table 2 shows the results for the questions for indicator A, on recognizing the need for information.

In the results for the next indicator (indicator B) on locating information, we begin to observe several important variations (see table 3). Although the results were still high (averages above 4, an average percentage of 80.2, and medians and modes of 5), there is a clear difference between, on the one hand, comparing information from several sources and visiting several types of information sources, and, on the other hand, quoting the source and author of the information obtained. While the averages for the first two items were high and similar (4.71 and 4.79), we can see that Spanish secondary school teachers did not agree on the third item, recording a wide range of scores (high standard deviation of 1.519) and an exceptionally low percentage (69.5%) compared to their scores for all the other items from the first two IL indicators.

The results for the third indicator (indicator C), on evaluating information, were similar to those for indicator B (table 4). While the average percentage for the responses was considerably lower (64.3%), we also find the lowest range of responses for one item and the widest range of those for another in the same indicator. For example, the responses of the secondary school teachers with regard to their ability to distinguish between important and non-important incoming email messages varied widely (with one of the highest standard deviations of the whole questionnaire (1.760), a median of 4 and a mode of 1). On the other hand, the same Spanish secondary school teachers

Table 2. Indicator A: Recognising the need for information

A. Recognising the need for information		%	Mean	Median	Mode	Standard deviation	Variance	Average %	
19. Finds information on the Internet for work-related issues.	1	0.5	5.18	5	6	.949	.899		87.8
	2	1.4							
	3	4.3							
	4	11.4						93.8	
	5	38.0							
	6	44.4							
20. Locates information on the Internet quickly and efficiently.	1	3.7	4.63	5	5	1.269	1.610		
	2	3.5							
	3	9.0							
	4	21.2						83.8	
	5	35.5							
	6	27.1							
21. Identifies the objective, problem or reason for their search.	1	0.7	4.61	5	5	1.024	1.048		
	2	2.3							
	3	11.1							
	4	25.6						85.9	
	5	42.0							
	6	18.3							

Table 3. Indicator B: Locating information

B. Locating information.		%	Mean	Median	Mode	Standard deviation	Variance	Average %	
35. Compares the information with information from other sources.	1	0.7	4.71	5	5	1.146	1.313	83.9	80,2
	2	3.8							
	3	11.5							
	4	19.8							
	5	36.1							
	6	28.0							
36. Visits several types of information sources.	1	0.7	4.79	5	5	1.093	1.194	87.1	
	2	3.4							
	3	8.8							
	4	19.4							
	5	39.4							
	6	28.4							
39. Quotes the source and the author of the information obtained.	1	5.0	4.21	5	5	1.519	2.307	69.5	
	2	13.4							
	3	12.0							
	4	19.1							
	5	25.9							
	6	24.5							

agreed on their ability to distinguish between important information and non-important information, recording one of the highest percentages on this item (89.3%) and the lowest standard deviations of the whole questionnaire (0.941). On the other hand, they failed to agree on whether to afford greater reliability and veracity to digital or analogical resources: just over half of those surveyed were in favour of information from digital sources, while the rest were in favour of information from analogical sources.

For the next indicator (indicator D), the results on self-perception were the lowest of all (table 5). Although the range of responses was wide (with standard deviations of 1.839 and 1.476), for the two questions on ability to organize information, the percentages (49.0% and 14.75%) and means (3.50 and 2.31) were the lowest results of the entire questionnaire. Less than half the teachers use a system for classifying and managing email and very few know or use any type of content reader or aggregator.

The results for the final indicator (Indicator E), on transforming information, show that only 74% of secondary school teachers in Spain are able to convert the information obtained from their Internet searches into their own content (table 6, see in next page).

After the teachers had answered all the questions from the five IL indicators, and after they had read our definition of IL, we added another question in order to obtain an overall assessment of the self-perception of the IL level of Spanish secondary school teachers. The results obtained from this question are shown in table 7.

Here we observe a certain tendency towards central scores, with an average of 3.70 and a percentage of 59.6%, which is slightly lower than would be expected from the results from each indicator individually. As we can see in table 8, the average self-perceived IL level from all the indicators (76.6%) was eight points lower than the estimated self-perceived IL level from the overall assessment.

4. Discussion and conclusions

Both the average score for the indicators used to define IL (67.6%) and the self-perception score recorded by the school teachers after reading a definition of IL (59.6%) show that these school teachers have a high self-perception of their information literacy. Our results also show that, although the IL level of the teachers seems to be high, some IL indicators are more indicative than others. The standard deviations for the various questions of these indicators are fairly homogeneous. This confirms that the range of responses is fairly narrow and reaffirms the validity of the responses.

Table 4. Indicator C: Evaluating information

C. Evaluating information.		%	Mean	Median	Mode	Standard deviation	Variance	Average %	
18. Distinguishes between important and unimportant incoming emails.	1	19.1	3.52	4	1	1.760	3.096	51.3	64.3
	2	13.8							
	3	15.8							
	4	16.9							
	5	16.0							
	6	18.4							
22. Distinguishes between important and unimportant information.	1	0.4	4.70	5	5	.941	.886	89.3	
	2	1.3							
	3	9.0							
	4	24.9							
	5	45.8							
	6	18.6							
38. Affords greater reliability and veracity to digital resources than to analogical resources.	1	5.1	3.61	4	3	1.297	1.681	52.4	
	2	14.9							
	3	27.6							
	4	26.2							
	5	18.3							
	6	7.9							

Table 5. Indicator D: Organising information

D. Organising information.		%	Mean	Median	Mode	Standard deviation	Variance	Average %	
17. Uses a system to classify and manage emails.	1	21.4	3.50	3	6	1.839	3.382	49.0	31.8
	2	13.3							
	3	16.3							
	4	13.5							
	5	13.7							
	6	21.8							
26. Uses an RSS reader or aggregator to manage content.	1	34.0	2.31	2	2	1.476	2.179	14.7	
	2	36.6							
	3	14.7							
	4	1.7							
	5	5.3							
	6	7.8							

A more detailed analysis of the IL indicators shows that although indicator A (on recognising the need for information) and indicator B (on locating information) obtain high teacher self-perception scores (87.8% and 80.2%, respectively), the other three indicators do not. Indicator E (on converting information) and indicator C (on evaluating information) obtain acceptable scores of 74% and 64.3%, respectively. However, indicator D (on organising information) obtains a worryingly average score of 31.8% and a score of less than 50% on both of the questions that make up this indicator (49% and 14.7%, respectively).

Secondary school teachers do recognise the need to search for information on the Internet for work-related issues (93.8%), find this information quickly and efficiently (83.8%), and identify the objective, problem or need precisely (85.9%).

They are also proficient at locating information, comparing it with information from other sources (83.9%) and visiting numerous sources to locate information (87.1%). However, only 69.5% of the school teachers who completed the questionnaire quote the source or author of the information. This figure is very low figure considering the importance attached to doing so.

The school teachers in the study present major deficiencies when it comes to evaluating the information they find. Although they distinguish fairly well between important and non-important information (89%), they find it extremely difficult to distinguish between truly important incoming emails and those that are not so important (51.3%). They also have severe doubts about whether to describe information they have obtained from the Internet as reliable and true in comparison with information they obtain from analogical sources (only 52.4% do).

The biggest problem school teachers have with regard to their self-perceived IL level undoubtedly concerns their ability to organise information. For example, only 49% of teachers use some form of system to classify and manage their email while, more worryingly, only 14.7% know and use a content reader, aggregator or indexer. Spanish school teachers, therefore, recognise that they are bad administrators of information: although they know they need information and they know how to find it, they are unable to organise or classify it.

Finally, it is worrying that 26% of the teachers surveyed admit that they still use the information they obtain from the Internet without modifying it or identifying its author, especially when the percentages for knowing how to localise and identify the object of their information search are, as we have seen, 83.8% and 85.9%, respectively. The quality of the information converted and later communicated is considerably diminished by these results.

In conclusion, Spanish secondary school teachers are less competent at producing and communicating information than one would think. When added to the other difficulties they have in evaluating and organising information, this leads us to suggest that our teachers require training both in producing and disseminating information (this has already been proposed by Area and Guarro (2012), in their analysis of information and digital literacy) and in evaluating and managing information. Clearly, teachers are not only better trained in digital competence nowadays but they are also more interested in it (Pérez & Delgado, 2012). However, the training they receive is often not of the best quality and it is not offered to every teacher who wishes to receive it. This presents us with an important challenge with regard to the promotion of learning and greater knowledge for all concerned. Other countries, even those with fewer deficiencies in the IL

Table 6. Indicator E: Transforming information

E. Transforming information.		%	Mean	Median	Mode	Standard deviation	Variance	Average %	
40. Does not simply copy and paste the information he or she finds on the Internet.	1	1.0	4.31	4	5	1.176	1.383	74.0	74.0
	2	5.8							
	3	19.2							
	4	25.2							
	5	33.0							
	6	15.8							

Table 7. Self-perceived IL level									
Self-perceived IL level.		%	Mean	Median	Mode	Standard deviation	Variance	Average %	
46. Self-perceived IL level.	1	3.6	3.70	4	4	1.156	1.336		59.6
	2	11.6							
	3	25.2						59.6	
	4	35.8							
	5	18.8							
	6	5.0							

levels of their teachers, are affording IL the importance it deserves and implementing improvement plans and training schemes in this area. In South Africa, for example (Fourie & Krauss, 2010), such programmes have become part of social education policy involving not just teaching institutions but whole cities. The United Kingdom has a programme to detect deficiencies in the IL levels of its teachers based on the already mentioned study conducted by Williams & Coles in 2003. And some states in the United States even provide specific IL information and courses for both teachers and pupils one month every year. These examples ought to encourage our country to also implement quality training measures aimed at improving the IL levels of our secondary school teachers and creating a correspondingly beneficial impact on the IL levels of our pupils at such a vitally important stage in their education, especially if we take into account observations over several years from the various educational computing programmes of the Spanish autonomous communities (Martín-Hernández, 2010) and the contents of the latest proposal from the Spanish Ministry of Education (INTEF, 2014).

Table 8. Overall self-perceived IL level		
	Mean	%
Self-perceived IL level (calculated)	4.11	67.6
Self-perceived IL level (estimated)	3.70	59.6

In light of these results and our analysis of them, our final conclusion is that Spanish education authorities need to be alerted to the fact that secondary school teachers require training to improve their information literacy. Such training should focus on the specific aspects and indicators we have mentioned in this study regarding the evaluation, organization, management and transformation of information.

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