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Categorization, Item Selection and Implementation of an Online Digital Literacy Test as Media Literacy Indicator

Categorización, selección de ítems y aplicación del test de alfabetización digital on-line como indicador de la competencia mediática

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ABSTRACT

This paper aims to measure a population's level of knowledge and active use of certain digital tools that play a primary role in developing their media literacy. To achieve it, an Online Digital Literacy test was designed to measure the knowledge and active usage of 45 different online software packages. This tool works as a reliable indicator to identify a population's media literacy development in terms of its linguistic and technological dimensions. More than 1,500 subjects of different gender, age and level of studies were tested in different cities within the autonomous community of Castilla and León in Spain, to measure their competence using these tools. The resulting data has enabled the identification of the level differences between age groups and gender and to formulate proposals in respect of digital literacy to enhance the public's competence in terms of media education. The general results indicate that people's Online Digital Literacy level is lower than ideal and that there is a level divide in relation to gender and age and that the average user has a social and recreational profile as a consumer of pre-existing content on the Internet rather than as manager, instigator or creator of his or her own content. This paper's conclusions therefore raise awareness of these deficiencies and encourage academic institutions to design specific digital literacy educational programmes to help citizens become media empowered.

RESUMEN

La presente investigación nace con el objetivo de medir el grado de dominio por parte de la población de una serie de herramientas digitales que juegan un papel clave en el desarrollo de la competencia mediática. Con ese fin, se ha elaborado una categorización que intenta abarcar todas las funcionalidades que la Web 2.0 brinda al usuario. Posteriormente, se ha delimitado cada una de ellas a través de tres ítems digitales concretos de uso extendido en la sociedad mediática. La selección realizada conforma un test de alfabetización digital on-line (test ADO) que mide el grado de conocimiento y uso activo de dichas herramientas, y que, por tanto, compone un indicador significativo de la competencia mediática en sus dimensiones lingüística y tecnológica. El test ha sido administrado a una muestra de más de 1.500 sujetos de diferente edad y nivel de estudios con el fin de obtener datos que ayuden a establecer objetivos en el panorama de la alfabetización digital y contribuyan hacia el empoderamiento ciudadano en materia de educación mediática. Los resultados y conclusiones generales indican que el nivel de alfabetización digital on-line del ciudadano medio no es el deseado, que existe una brecha digital generacional y de género, y que el perfil medio del usuario de Internet es más social, recreativo y consumidor de contenidos existentes, que proactivo, gestor y creador de contenidos propios.

KEYWORDS | PALABRAS CLAVE

Media education, educommunication, media literacy, digital literacy, languages, technology, empowerment, user profile.
Educación mediática, educomunicación, competencia mediática, competencia digital, lenguajes, tecnología, empoderamiento, perfil de usuario.

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1. Digital literacy as linguistic and technological dimensions of media competence

Following many years of debate around terminology it now appears unquestionable that media education should encompass a series of literacies that go beyond the simple acquisition of the long-desired digital competence; but competence in the areas opened up by the digital era still remains, to some extent, one of the fundamental pillars on which educommunication rests in the XXI century. We are surrounded by a plethora of «umbrella concepts» characterised by the diversity of their perspectives and a multitude of definitions (Koltay, 2011). As a result, in this article it has been decided to refer to «education» as the process, «literacy» as the result and «competence» as the set of skills that must be developed to achieve the result. Furthermore, the label «digital» refers to any aspect that relates specifically to the digital environment and «media» refers to the wider field of educommunication. However, as Gutiérrez & Tyner (2012: 37) suggest, «if we concern ourselves more with identifying the differences between «media education» and «digital competence» than attempting to reconcile them we will only dilute our efforts and may even generate greater conflict». To some extent this was the policy adopted by UNESCO in 2011 in an attempt to reconcile traditionally conflicting viewpoints when they opted to use the term «media and information literacy» (MIL).

When placing this current study in context it is impossible not to refer to Ferrés & Piscitelli (2012: 75-82) and their assertion that media competence has six core features: language, technology, production and dissemination processes, reception and interaction processes, ideology and values and the aesthetic dimension.

Although, to some extent, it inhabits every one of these dimensions, digital literacy relates directly to two of them in particular, the linguistic and the technological dimensions; linguistic in terms of everything related to codes, means and languages that comprise the digital information at our disposal and technology in terms of the ability to manipulate the tools (software or hardware) which give us access to this information. According to Dornaletche (2013) we can talk of «off-screen literacy» and «on-screen literacy». At the same time, whatever appears «on screen» can be subdivided between what happens online and offline. Everything relating to the offline use of media is constantly reducing as the tendency is towards a permanent online digital experience. It is therefore these digital tools that enable us to engage with different forms of a «participation culture» such as membership of user communities (Facebook), the generation of new forms of creative expression (mash ups), the development of knowledge through collaboration (Wikipedia) or the diffusion of and access to new information streams (blogging and podcasting) (Jenkins, 2009).

It is important to clarify that this study did not intend to concentrate solely on this online experience, on that part of digital literacy that resides «on screen» and at the same time «on the net». In this article this will be referred to as «online digital literacy», not from a desire to add yet another label to a technological feature that often creates confusion but rather to provide the focus for this study and construct a framework for the array of digital tools mentioned throughout the paper.

Despite its concentration on a particular element of digital literacy, this study tries to avoid the pitfall of reducing the concept of media education to the development of digital competence in its «most technological and instrumental dimension» (Gutiérrez & Tyner, 2012: 38). Instead it aims to explore in depth one fundamental aspect which has a significant effect on two of its dimensions (language and technology) without ignoring the very real importance of the other four dimensions. To this extent the present paper strongly supports the «need for interdisciplinarity in educommunication» (Gozálvez & Contreras, 2014: 13). The authors believe that studies such as the current one, focused on user behaviour around new and constantly evolving digital tools, should be compatible with studies concerned with empowering users based on a more ethical, shared and integral concept of media education. This approach entails more than the development of a series of practical skills or a call for additional creativity (Buckingham, 2010) and emphasises the need to acquire «mental habits, knowledge, skills and competencies required to be successful in the XXI century» (Hobbs 2010: 51). It is acknowledged that some tools included within this study, such as social networks, «do not always guarantee a conscious and enriching use of communication systems and media to promote intelligent exchanges» (García-Matilla, 2010: 167) and we therefore believe that the study of the knowledge and active use of these digital items should not conflict with the «desire for permanent construction and reconstruction of critical thinking» (García-Matilla, 2010: 168) which the educommunication tradition has always followed.

Finally, based on the current state of research into the field of media education, it would be wrong to omit mention of the increasing contributions coming

from the field of neuroscience, which indicate how vital it is that «the ability to exploit the instruments is accompanied by an ability to deal with the mind, both one's own and other peoples» (Ferrés, 2014: 239).

2. Opening the door to users with new profiles

An initial investigation of the issues confirmed how terms such as Google, Facebook, Whatsapp, Instagram, etc., have changed our lives, not only in terms of digital-media but also with regard to classic reading-writing literacy, as hardly a day passes without us reading or using some of the names of the digital products included within this article. «We can now Google» things and we have abbreviations to express ourselves more easily, such as «LOL» (laugh out loud), or «OMG» (Oh my God!). New technologies have also delivered new words such as iPhone, iPad or Droid (De-Abreu, 2010: 1). In the case of Wikipedia it represents «a living book which becomes more intelligent and comprehensive every day, thanks to the informally coordinated actions of millions of human beings across the planet» (Johnson, 2013: 222). No-one talks these days about «message Servers», «instant messaging applications» or «social networks», but only about Gmail, Whatsapp and Facebook. It is therefore essential to create a system of categorisation for this array of constantly evolving digital tools to establish a list of items covering these brand names and specific software products to enable identification of their current usage among the public. «The Internet provides a range of digital tools and information distribution networks which enable people to join together in new forms of collective activity. Communities now exist for the creation and sharing of knowledge (Wikipedia), culture (YouTube, Flickr, the blogosphere), tools (free and open code software), markets (e-Bay, Craigslist), education (Open Educational Resources), journalism (citizens journalism) and political organisations (meetups, netroots activism, smart mobs)» (Rheingold, 2008: 25). Furthermore, but without wishing to focus too greatly on the experiential ground, this paper proposes a way in which this categorisation and list of items can develop in the future to measure digital literacy in new ways without being subject to categories or items fixed in time.

The dimensions of media literacy mentioned above (Ferrés & Piscitelli, 2012: 75-82) are not only there to establish a simple classification of indicators but each of them develops its own content through two areas of participation: the area of «analysis» and the area of «expression». The area of analysis relates to those people that «receive messages and interact with them», whilst the area of expression concerns those that actually «create messages», taking into account that for many years «the creation of content has become easier than ever and a single technology can be used to both send and receive information» (Livingstone, 2004: 8). This reflects the traditional division between users that are just receivers and those that, faced with the opportunities available today, go one step further and could be called «emirecs» (Cloutier, 1973), «prosumers» (Toffler, 1980), «interlocutors» or indeed given some other appropriate label. However, based on the results obtained from the ADO test, it was considered important to analyse further this customary differentiation between media users to ask if these days we can talk about new types of profiles, beyond those of consumers and prosumers, or whether, as a result of the developing processes of

> The results of this survey suggest that educational institutions and bodies should design specific programmes to address the deficiencies in Online Digital Literacy that have been uncovered. This proposal is based on some of the disturbing data captured by the study, such as the confirmation that: (1) the average subject surveyed did not meet the anticipated level of knowledge and competence to achieve Online Digital Literacy, (2) even having a university education did not guarantee achieving the proposed average level, (3) the average Internet user has a passive profile and (4) females are less empowered than males in this area.

interaction with messages, we can establish any new profiles either within the «area of analysis» or the «area of interaction».

If digital literacy conforms to a central axis of what we call media education or, in the words of UNESCO, media and information literacy, then significant importance should be given to research that explores the assortment of new digital tools that erupt into the media panorama on a daily basis and which change in an instant our most rooted communication habits and formats.

Educational institutions should therefore consider ways to reduce the digital divide between the generations, increase the empowerment of females at a technological level from a young age and strengthen the range of expressive, creative and constructive content on the Internet through providing courses for the whole population.

3. Objectives, hypotheses and methodology

An instrument was designed for this study with the aim of measuring people's knowledge and their active use of a range of online digital literacy items. The items related to a set of programmes concerned with searching, creating and disseminating digital messages through the Internet. The results of this Online Digital Literacy test (ODL test) were used to develop specific educational proposals with the aim of empowering those sections of the population that need it most to control the digital tools they are least competent with.

The ODL test comprised three modules. The first included the socio-demographic variables; age, gender and highest qualification level, together with the question «Have you ever used the Internet?». The second module contained 45 items relating to the use and knowledge of specific digital tools. Finally, the third module comprised two questions: one about their main reasons for using the Internet (preferred online activities) and the other about the ways they learned how to use the Internet.

Five discussion groups were created to determine the 45 items that would go into the second and third modules of the ODL test. Each discussion group comprised eight students from each of the different year groups on the Advertising and Public Relations Degree courses of the University of Valladolid (Spain) at the María Zambrano Campus in Segovia. The decision to involve students in the groups was based a priori on the fact that they represent one of the segments of society that is most active on the Internet and, consequently, have a higher level of competence in using online digital literacy items. The objective for each group was to determine a range of basic activities for an Internet user with average knowledge of the Internet. The five groups identified 15 categories of activities: browsers (access to Internet), operating systems (a basic tool enabling access to Internet), search engines (for locating information), E-mail (messaging tool), telecommunications (calls and messaging), mobile devices (devices for accessing the Internet), social networks (information sharing, meeting people, promoting events), video (watching, editing and sharing videos online), photos (viewing, editing and sharing images online), music (listening to and sharing music), servers (storing and sharing information), web/blog creation (producing and managing content), downloads (downloading files), online fiction (watching films or TV series for free), and shopping (buying and selling). The third module contained open questions and the responses were codified according to the predominant responses received. The main uses of the Internet were determined as: communicating, keeping up to date with information, accessing entertainment and for learning. In terms of learning how to use Internet the responses were: being self-taught, taking a course or being shown by friends or family. The primary activities undertaken on the Internet were considered to be: social networking, communication, chat, forums, E-mail, work, videogames, specialised information, downloads, watching and listening online, shopping and pornography.

Next, three items or tools were identified for each category in the second module: 1) Search engines were represented by Google, Bing and Altavista, 2) Browsers by Explorer, Chrome and Firefox; 3) Telecommunications by Skype, Viber and Whatsapp; 4) Video by YouTube, Vimeo and Dailymotion; 5) Photos by Flickr, Picassa and Instagram, 6) Servers by Megaupload, Dropbox and Hotfile; 7) Downloads by Taringa, JDownloader and uTorrent; 8) E-mail by

Gmail, Hotmail and Yahoo; 9) Creation of web/blogs by Blogger, Wordpress and Wix; 10) Shopping by Ebay, Paypal and Amazon; 11) Music by Spotify, iTunes and Soundcloud; 12) Social networks by Facebook, Twitter and Tuenti; 13) Operating systems by Mac, Windows and Linux; 14) Mobile devices by e-book, iPad and Samsung Galaxy and finally 15) Online Fiction by Cinetube, Peliculasyonkis and Divxonline. The order of the items on the questionnaire was random to prevent any patterns in the responses.

The respondents were asked whether or not they knew of each item and if they actively used it. The responses were categorised using a Likert type scale with three values: 0 if they did not know of it; 1 if they knew of it and what it was used for but did not use it themselves; and 2 if they knew of it and used it themselves. This scale was used to categorise the responses in the simplest way possible so they could be fully exploited. The highest score that any item in each category could score was 6, so, based on the 15 categories, the ODL test had a maximum score of 90 points. The minimum value any item could achieve was 0 (no competence); 1 (low level competence); 2 (low to average competence); 3 (average competence); 4 (average to high competence); 5 (high level competence); and 6 (highest competence). Although it may be a useful guide this ODL test was not intended to produce an absolute value for digital literacy; it aims only to offer a specific and useful indicator of it and, by extension, of media competence in the linguistic and technological dimensions. Having an overarching view of the extent to which key tools are used can help us determine user profiles. Nevertheless, the phrase «ODL level» is used in this paper to refer to the general score of the subjects in the test and to enable the sociodemographic variables to be cross-referenced with the main uses and the way people learned to use the Internet. From 0 to 18 points was classed as a low ODL level, 19 to 36 as low to average, 37 to 54 as average, 55 to 72 as average to high and 73 to 90 as a high ODL level.

Based on the work in the discussion groups five key hypotheses were formulated: 1) the highest scores would be in the categories of messaging, searching and information sharing, using e-mail, Operating systems, Browsers, Social networks and Telecommunications as these represent the tools that have been available to the population for the longest period; 2) the lowest scoring categories would be those relating to managing, storing, and creating content using Servers, Downloads, and Web/blog spaces as they are the ones which a priori require higher levels of knowledge and proactivity on the part of the user; 3) the ODL level would be inversely proportional to the age range of the respondents and there would be significant statistically significant differences between them; 4) the gender variable would not be significant in the ODL level; 5) the year of study of the respondents would be a factor that affected the ODL level.

The survey respondents conformed to a representative sample of the residents of the autonomous community of Castilla and León (Spain) (N=1506), distributed between 4 age ranges (15-29 years N=166 / 30-44 years N=499 / 45-64 years N=459 / 65–99 years N=382), in quotas established in accordance with the population in the various provincial capitals (Ávila N=120, Zamora N=120, Segovia N=120, Burgos N=205, Soria N=120, Palencia N=120, León N=154, Salamanca N=178, Valladolid N=368) and also proportional to gender. The questionnaires were delivered face to face and randomly on the streets of the provincial capitals by members of the previously established «Communication competence in the digital context in Castilla and León» research team (REF: VA026A10-1), during the 2010-11 academic year. Cronbach's Alpha coefficient (α=0.961) was applied to assess the reliability of the test. Also, to measure the statistically significant variances between variables, both the average comparison and the ANOVA one-way analysis of variance tests were applied. Statistical significance is assumed when $P \leq 0.05$.

4. Results

The overall result of the ODL test for the population was 25 points; average to low. The only age range that scored 50% was 15-29 years with 45 points (an average ODL). They were followed by the 30-44 years range with 41 points (an average ODL level), the 45-64 years range with almost a 100% decrease at 23 points (an average to low ODL level) and finally the 65-90 years range with 2 points out of 90 (a low ODL level). Significant variations in the levels were found between each quota (P=0.001).

If the results for each category are examined in more detail it can be seen that the three items that scored most highly for each age range were E-mail, Browsers and Social Networks, which to some extent supports our initial hypothesis. However, the Telecommunications category (Skype, Whatsapp, Viber) was at the lower end, a long way from being the highest scoring. In last place, as predicted, came the category of Creation of web/blog sites, Servers and Downloads, although it was not expected that Photos

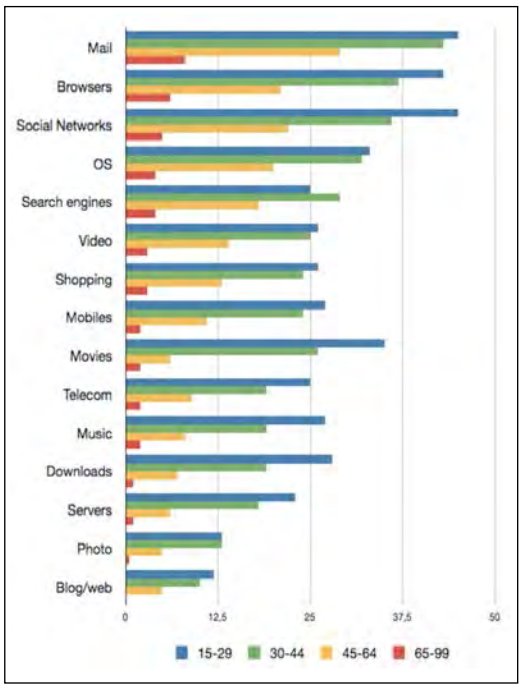

Figure 1. Categories of knowledge and use by age range.

and Music would also score so low. As can be seen from Figure 1 the only category in which the second age range scored more highly than the first was in that of Search engines. In contrast, the first age range scored significantly higher than any other age range in the use of Social Networks, Downloads, Servers and accessing Fiction online.

The cross-referencing of data from the categories of use and knowledge with the gender variable showed significant differences in the scores of males (N=745) and females (N=761) within the overall scores of the population, as per Figure 2. If further cross-referenced against the age variable, contrary to what might be expected, further significant differences were found in the two initial age ranges (15-29; P=0.001; 30-44; P=0.001). However, for the third and fourth age ranges the responses by gender were more homogeneous (45-64 P=0.321; 65-99 P= 0.081). Much greater differences were found in the categories of Mobile devices, Downloads and Servers.

The level of studies completed by the respondents was found to be a variable that affected online digital literacy. Those with no or only primary studies completed (N=392) got the lowest ODL score. They were followed by those with secondary education or equivalent professional training (N=470). Finally, those respondents with a university degree (N=643) had the highest digital literacy. The most revealing result, though, was that having a university degree did not guarantee an average ODL level, as the graduates scored no higher than 34 points out of 90, as can be seen in figure 3.

With regard to the main purpose for respondents' use of the Internet the data showed that 31% used the Internet primarily to access information, 18% for entertainment, 16% to access training or education, whilst 36% responded that they used it for communicating. Cross-referencing the main use of the Internet with the age variable showed that age significantly affected the primary use (P=0.045). As seen in Figure 4, the first age range (N=165) were those that used the Internet most for games (30%) and communication (38%). The second age range (N=484) were those that most used it to access training and education (21%). In the third age range (N=338) there were significant increases in use for accessing information/news (37%) and communication (35%) at the expense of entertainment (13%). The same happened in the final age range (N=81) as in the third age range but in a more dramatic way. The primary use for training/education fell to 4% and for entertainment to 8%. There was no significant variation between male respondents (N=554) and female respondents (N=514) in terms of the primary use they made of the Internet but there were differences in the way they learnt how to use the Internet (P=0.001). Males tended to be more self-taught (77%), and females more likely to take a course or be taught by family members or friends (55%). Likewise,

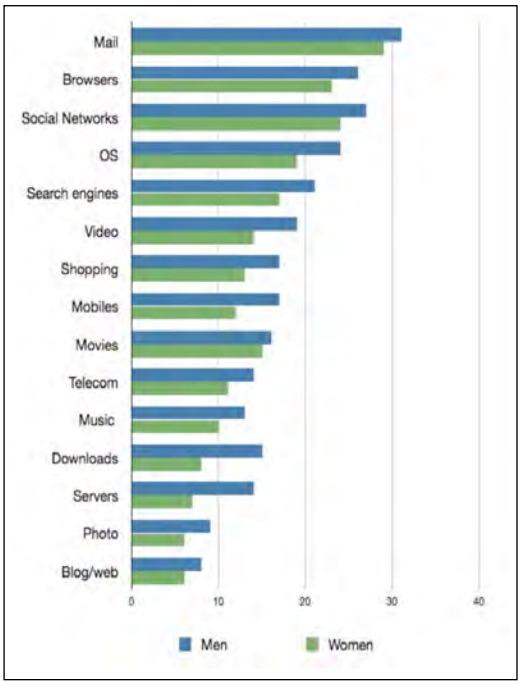

Figure 2. Categories of knowledge and use by gender.

significant variances can be seen between the age range and the way they learnt to use the Internet (P=0.001). Not only did 80% of respondents between 15 and 29 years of age consider themselves to be self-taught, they scarcely contemplated the notion of learning from a member of their family (1%).

When analysing the primary activity on the Internet of the study population it can be seen that there were significant differences between the age ranges of the study subjects (P=0.042). The first age range (15-29) was found to spend more time on social networks (34.5%) and less on E-mail (5.5%). A total of 32.8% of activity related to searching for information and 12% to watching/listening online and playing videogames. Working/studying (4.8%), Shopping (4.8%)

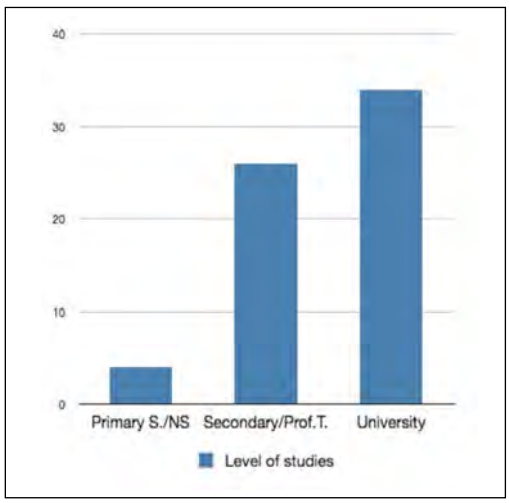

Figure 3. Level of ODL by level of completed studies.

and Downloads (5.2%) appeared to be secondary uses. For the second age range (30-44) E-mail 19.2%) was a higher priority than Social media (11.4%). Respondents in this age range dedicated the highest proportion of their time to searching for specialised information (27.9%) and accessing the communication media (16.1%). Strangely, they spent less on shopping on the Internet (2.6%) despite being the group with the greatest purchasing power. A clear increase in the use of E-mail (27.5%) at the expense of Social networking (1.5%) was found in the third age range (45-64). Together with the second age range this was also the group that used the Internet the most for seeking specialised information (30.5%) and for work (12.7%). Among respondents in the final age range (65-99) the range of activities decreased to just five. Their main interests were in accessing communication media (39.5%), searching for specialised information (19.7%) and using E-mail (34.2%). Although not statistically significant, several subjects mentioned video-conferencing as a primary use of the Internet (5.3%).

5. Discussion

Although it might seem unsurprising that the results of the study identified a digital gap between the generations they also indicated clear weaknesses in digital

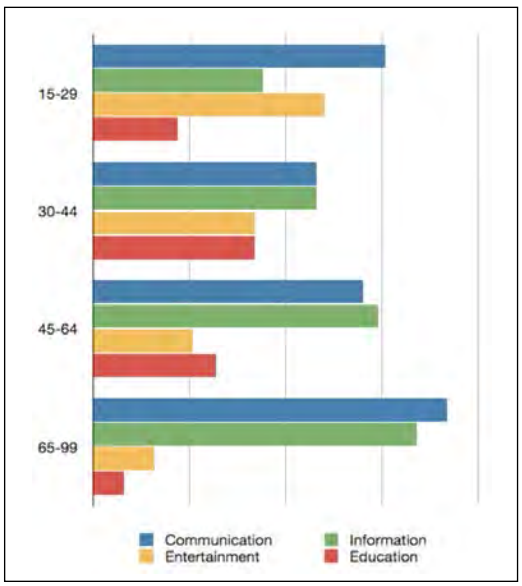

Figure 4. Primary use of the Internet by age range.

competence even among members of the earliest age ranges. This is worrying as it suggests a scenario in which young people are not fully exploiting the opportunities for personal growth and learning that the Internet offers and that opting for a self-taught approach, as suggested by the results, is not working well enough. Neither is having a higher level of education any guarantee of achieving an average level of Online Digital Literacy.

Of no less concern is the fact that the category of creation of own content using blogs was relegated to last place. Confirmation of the second hypothesis means that only a very small percentage of the population understands and actively uses the content management tools on the Internet. In other words, within the study population practically no content generators were found.

In terms of understanding the profile of the average Internet user within Castilla and León the data suggest they have a passive profile, focused on interacting, communicating, searching and downloading. The youngest use the Internet mainly to communicate with other users. Their main focus are the social networks; there they share their experiences and state of mind,

recommend things to their community and follow the recommendations of others. It could be said they have a «social and recreational profile» (socializer). Subjects within the second age range focused more on searching for specific information, on their own training/-education and on keeping informed and were not interested in social networks or particular websites or special interest forums and only resorted to downloading when they needed to resolve a particular issue (searcher/downloader).

Although these two groups' profiles are proactive and they both understand and use new technologies a lot they are certainly not empowered in the areas of expression and creation. In this sense, among the study subjects surveyed, none displayed the type of profile of an individual that regularly generates and shares information. Those people with a more creative profile (uploader) tend to have accounts with Instagram or Vine where they share their artistic photos and with Vimeo or YouTube to share their videos. An uploader will have their own blog, forum, website or portfolio where they exhibit their work. An uploader creates content that may initiate a trend of become a «trending topic» and constantly updates their knowledge of and competence with the technology. An uploader has a high ODL level and also shares the characteristics of the other profiles (downloading, searching and interacting). Individuals with this profile are equally empowered as consumers of information and therefore in creating and expressing it as well. In contrast, the average user identified within this survey is far from being an uploader, someone who is empowered from both an expressive and technological point of view.

The average user identified from the survey in Castilla and León not only lacked creativity but, in line with other recent similar studies (Literat, 2014), significant differences were found in the level of ODL between males and females. These differences in the ODL levels between the genders occured mainly in the two earliest age ranges, which is of concern as it indicates gender stereotypes which need to be addressed. There were no significant differences in the knowledge and use of particular categories however. No tools were used predominantly by males or by females. The results were more general, as in every category males scored higher than females to a statistically significant degree.

6. Conclusions

The results of this survey suggest that educational institutions and bodies should design specific programmes to address the deficiencies in Online Digital Literacy that have been uncovered. This proposal is based on some of the disturbing data captured by the study, such as the confirmation that: (1) the average subject surveyed did not meet the anticipated level of knowledge and competence to achieve Online Digital Literacy, (2) even having a university education did not guarantee achieving the proposed average level, (3) the average Internet user has a passive profile and (4) females are less empowered than males in this area. Educational institutions should therefore consider ways to reduce the digital divide between the generations, increase the empowerment of females at a technological level from a young age and strengthen the range of expressive, creative and constructive content on the Internet through providing courses for the whole population.

This survey provided further evidence (Aguaded et al., 2011; Ferrés & al., 2011) of a lack of media literacy among the general population, in this case in relation to a lack of competence in the use of particular digital tools which are increasingly common and widespread and without which it is becoming ever more difficult to operate in the hypermedia context that surrounds us. An up-to-date and constantly-developing proficiency with these tools will never equate to acquiring full digital literacy but it will significantly support the empowerment of the population and the development of the competences that result in media literacy.

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Notes

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