

Digital Literacy and Undergraduates' Values

Paulo Alves^{1,2}, Carlos Morais^{1,3}, Luísa Miranda¹, Paula Renés Arellano⁴

¹Instituto Politécnico de Bragança, Portugal

²Research Centre in Digitalization and Intelligent Robotics (CeDRI), Instituto Politécnico de Bragança, Portugal

³CIEC – University of Minho, Braga, Portugal

⁴University of Cantabria, Santander, Spain

palves@ipb.pt

cmmm@ipb.pt

lmiranda@ipb.pt

paula.renes@unican.es

Abstract: Digital literacy has been in the spotlight at all levels of education and society in general. It has been treated and analysed within various dimensions and perspectives, namely dimensions associated with information, communication and technology, and perspectives related to technical and cognitive aspects. However, emphasis has seldom been laid on social values when handling digital literacy and particularly the Internet. It is important that digital literacy is not anchored in technology for the sake of technology only, but in the society's coherent development, which cannot exclude the culture of consolidated social values and the construction of new values which enable the harmonious evolution of society in an era characterised by innovation, interconnection and knowledge. This study, conducted in the academic year of 2016/2017, involved a sample of 724 undergraduates attending two public higher education institutions, a Spanish one and a Portuguese one. Among the results obtained, we highlight that the majority of the undergraduates have been using the Internet for over 10 years and spend more than 30 hours a week searching for information predominantly related to academic life and current affairs. Most of the communications they establish online are with friends, relatives and colleagues. They give more attention to values when communicating online with friends and relatives than when communicating with colleagues. The identification of counter-values is higher in the communications established with colleagues than in those established with friends, and it is also higher in the communication with these latter than in the communication with relatives.

Keywords: digital literacy, internet access, internet values, higher education

1. Introduction

The efficient use of digital technologies has been a concern for society, especially for higher education institutions. Within the context of such institutions, where digital technologies are intensively used for a variety of purposes, it is a constant challenge for teachers and researchers to understand the kind of use undergraduates make of these technologies and the importance they give to social values when using them. Among the various digital technologies which could have been emphasised, the focus of this research work has been laid on the use of the Internet and on the values and counter-values associated with it.

This is a mixed methodology study which comprises both qualitative and quantitative aspects. The data was obtained by questionnaire in the academic year of 2016/2017 from a sample of undergraduates attending two different higher education institutions, a Portuguese one and a Spanish one. The main aims of the study are: identify the undergraduates' level of digital literacy; determine the undergraduates' perceptions regarding the use of social values and counter-values when communicating online.

The level of digital literacy is assessed based on the answers given to questions related to the use of the Internet, namely the frequency of use and the type of information searched for online. The data regarding the undergraduates' perception of the use of values and counter-values when communicating online was obtained from the answers given to questions related to the attention given to values and counter-values when communicating with colleagues, friends and relatives.

This paper is developed considering the following main topics: Literacy and values on the Internet, where we focus on digital literacy and on social values on the Internet; Methodology, where we present a brief characterisation of the study as well as of the sample involved; Results, where we present both the data and its interpretation regarding the undergraduates' digital literacy and their perception of the attention given to social values and counter-values when communicating online; Conclusions, with a synthesis of the main results. The paper ends with the bibliographic references which constitute the basis of the scientific grounding of this study.

2. Digital literacy and values on the internet

2.1 Digital literacy

Digital literacy represents a current topic of major interest and cannot be dissociated from the Internet nor from its various connected digital technologies since as stated by Dias (2017, p.7), «With the digital technologies, we build the new settings and methods for interacting and communicating in virtual communities and the reasoning for pedagogic innovation and scenarios of change.»

The main mission of higher education is to prepare undergraduates for the future. Digital literacy refers not only to ensuring that students can use the most recent technologies but also to developing their skills to select the right tools within a given context, deepen their learning outcomes and get involved in creative problem solving (Ventimiglia & Pullman, 2016).

Appel (2012) defined digital literacy as the capacity to find and analyse information using computers and the web. JISC (2014) put forward a broader definition of digital literacy which includes the capacities that an individual has to live, learn and work in a digital society. According to Reedy and Goodfellow (2012), digital literacy includes not only the capacity to search for and use information but also the communication, collaboration, teamwork, social conscientiousness within a digital environment, the understanding of electronic security and the creation of new information. Digital literacy is a comprehensive and complex concept which involves multiple elements or requirements and combines multiple dimensions, namely technical, psychological and interpersonal (Alexander, Becker, Cummins & Giesinger, 2017).

In association with digital literacy appeared the term digital competence, this latter more focused on the application of knowledge. Hatlevik and Christophersen (2013) adopted the term digital competence to describe the acquisition and processing of digital information and the capacity to produce digital information.

Vuorikari, Puni, Carretero and Brande (2016) highlight that according to the European Digital Competence Framework for Citizens, digital competence is the efficient use of information technologies for work, leisure, learning and communication. It includes the use of computers to recover, access, store, produce, present, and exchange information as well as to communicate and participate in collaborative networks via the Internet.

Ting (2015) related digital literacy to the student's autonomy by observing that digital native students search the Web resources autonomously outside the school to build their own digital literacy, they interact and learn with colleagues and access and share Web learning resources which are useful to school subjects, thus contributing to the improvement of their own autonomy and learning.

Also, most of students' acquisition of digital skills visibly occurs outside the school due to their need to communicate and learn. For example, they interact with friends using social networks and search for useful information to solve a given problem (Ng, 2012).

It is expected that a basic level of digital skills will be crucial for the vast majority of jobs in the future and that the need for higher levels of digital skills will increase (Berger & Frey, 2016; Rouse, 2016).

Since digital literacy helps leverage students' deeper learning outcomes, it can provide more fruitful careers. Higher education institutions must continuously think about the application of technologies in a number of ways in order to create learning environments which provide students with opportunities to develop their digital skills and enable them to achieve their goals in an increasingly more digital economy (Alexander, Becker & Cummins, 2016).

When students reach higher education, they already have a certain level of digital literacy, since they are acquainted with some digital tools and know how to use them. However, in most cases, they still lack the necessary skills to apply their digital literacy to the learning context.

Whenever the use of the Internet and of various digital tools implies some interaction with other people, social values become prominent, namely the values and counter-values adopted by students when communicating with friends, colleagues and relatives.

2.2 Social values on the Internet

The current process of globalisation in society is giving birth to new forms of interpersonal relations, inclusively leading to social fragmentation and an increase of the differences among countries.

It is common to hear that we are living a crisis of values (Minguez, 2012), that the society we live in has lost social and moral values and that these are not integrated in the relations of democratic and civic participation (Torrego, & Martínez, 2014). All this represents the dynamics providing the framework for social change and its relevance to the social structure and cultural patterns of each society. Hence, culture becomes the means towards a global understanding of knowledge, moral capacities and other individual capacities representing substantial elements in the various cultural societies. According to UNESCO (2015) and to Martínez-Martin, Puig_Rovira and Trilla (2009), this is the context in which the person has to face and adapt to their own moral experiences and the daily resolution of conflicts of interest.

There is an increasing need for studies focused on the individual for a deeper understanding of the individual use of ICT in the presence of different cultures. Although the Internet is global, its users work individually and are affected by different cultural values (Bagchi, Kirs, & Choden, 2015).

People in any country are likely to have contrasting perspectives on the Internet. There is evidence of this in the daily conversations as well as in debates about issues such as online content and privacy regulation. It does not necessarily mean that some people are right and others are wrong, but that groups of individuals are likely to have different values, attitudes and beliefs regarding the Internet, or in other words that online debates may be shaped by different Internet cultures (Dutton, & Blank, 2014).

According to López, Carpintero, Del Campo, Lázaro and Soriano (2010), values are ideas or convictions that individuals are able to assess and interpret as valid, thus providing them meaning and guidance. It is observable that values are considered essential in people's everyday life, something which is desired and appreciated and therefore, guides and favours coherent and responsible actions. Moral values are evident in society and in citizenship and materialise into ideas about the world, the models and the practices which guide the shaping of personal values (Halstead, & Taylor, 1996).

The democratic society and therefore, educational institutions must uphold education as an intentional process based on the person's intellectual development towards the resolution of conflicts (Bernardini, 2010). Hence, education must favour processes of understanding values universally respected and socially shared so that each individual can integrate society both critically and actively (Aretio, Corbella, & Blanco, 2010).

This is why the influence of the media and of the Internet in culture, lifestyles and in the acquisition of values is obvious. It permeates everyday life and therefore, requires some critical analysis which prevents the escalation of problems regarding the interpretation and understanding of messages emitted from those contexts (Buckingham, 2005; Gozávez, & Contreras, 2014; García-Ruiz, Ramírez, & Rodríguez, 2014). Preparing students for the labour market and training them as active citizens represent two fundamental goals of higher education (Santos, & Lorenzo, 2010). These institutions have a social commitment which goes beyond mere academic training. They are committed to promoting ethical values among their students and to helping them develop as democratic, tolerant and solidary citizens (Martínez & Esteban, 2005).

Nevertheless, the omnipresence of technology and the Internet enables the consumption of certain contents which may influence people's values and attitudes (Castells, 2001). Therefore, it is necessary to gain insight into the type of content, values and attitudes students possess and acquire on the Internet in order to determine, as far as possible, the values which characterise them and, if necessary, include specific training in the academic context that favours the education of democratic, responsible and competent citizens.

3. Methodology

This is a mixed methodology study containing aspects associated with quantitative research and others associated with qualitative research. The data was obtained by conducting a questionnaire containing both open and closed questions. Overall, the answers to the closed questions were treated by using an approach close to that of quantitative studies, since they enable the testing of the relation between variables (Creswell, 2014) as well as the quantification of the variation of a phenomenon or situation (Kumar, 2011). The answers to the open

questions were treated qualitatively since as suggested by Amado (2017), the use of open questions about a given topic can be highly useful in qualitative research, enabling respondents' free expression of opinions and since the analysis of the answers given allows the identification of respondents' perceptions, subjective experiences and representations regarding the topic under study.

For the treatment of qualitative data, a content analysis was carried out by following an approach close to that proposed by Bardin (2015), consisting of considering three chronological poles denominated as pre-analysis, exploration of the material and treatment of results, inference and interpretation. According to the author, this approach constitutes a set of communication analysis techniques which uses systematic and objective procedures of description of the messages content.

The study can also be considered exploratory with descriptive characteristics since it can be extended to other institutions and involve a higher number of students.

As previously mentioned, the data supporting this study was obtained by questionnaire in the academic year of 2016/2017, from a sample of 724 undergraduates attending two public higher education institutions, namely a Portuguese one and a Spanish one.

Among the 724 undergraduates, 606 (83.7%) attend the Portuguese institution and 118 (16.3%) attend the Spanish institution; 310 (42.8%) are male and 414 (57.2%) are female. The ages range from 17 to 56 years old, with an age mean of 20, a median and mode of 19 and a standard deviation of 3.2. The sample subjects attend the following bachelor degree courses: Accounting (10.1%), Management (14.6%), Informatics Engineering (11.5%), Sports (13.8), Basic Education (8.0%), Environmental Education (0.8%), Social Education (10.9%), Pre-primary Education (4.6%), Primary Education (11.7%), and Languages for International Relations (14.0%). With regard to the curricular year that the sample subjects attend, 61.9% are in the 1st year, 34.0% are in the 2nd year, and 3.5% are in the 3rd year. A percentage of 0.7% of the students did not indicate the curricular year they attend.

The results of the research are presented in the next section.

4. Results

The results are presented according to the aims defined for this research. Therefore, based on the sample subjects' answers to the questions associated with each aim, the results are presented from two main topics denominated as follows: Undergraduates' digital literacy; Undergraduates' perception of the attention given to social values and counter-values when communicating online.

The topic of digital literacy appears in this research due to a need to substantiate the claim that the students do possess skills to use the Internet, namely as far as communication is concerned, since only the fact that they have digital literacy to communicate enables the further determination of the attention they give to values and counter-values when communicating.

The questions which originated the data under analysis are listed in the presentation of results.

4.1 Undergraduates' digital literacy

The indicators regarding the sample subjects' digital literacy were obtained according to the frequency of Internet use and the kind of information students search for on the Internet.

The frequency of use was associated with the number of years for which the undergraduates have been using the Internet and the number of times they use it per week. From the answers given by the sample subjects to the question 'How many years have you been using the Internet for?', we conclude that the minimum number of years of Internet use is one year and the maximum is 22 years, the mean is 9.6 years, the median and the mode are 10 years, and the standard deviation is 2.6.

In terms of weekly hours, the frequency of use was determined based on the answers to the question 'Approximately how many hours do you use the Internet for per week (7 days)?' The analysis of the answers

shows that the minimum number of hours of Internet use is two hours and the maximum is 120 hours, the mean is 31.1 hours, the median 30 hours, the mode is 70 hours and the standard deviation is 26.3.

In order to assess the kind of information the undergraduates search for on the Internet, we analysed the answers given to the question 'What kind of information do you usually search for on the Internet?'

In the treatment of the answers, each kind of information mentioned in the answers given was considered as an analysis unit and each encoded analysis unit was considered as a register unit. Bardin (2015, p. 130) defines the register unit as «a unit of significance to be encoded and which corresponds to the content segment to be considered as a base unit, aiming at categorisation and frequency counting.» In the whole of the answers given by the 724 sample subjects, 1,211 units were identified (expressions that translate the kind of information the subjects search for online). The expressions are highly diversified, which makes it impossible to categorise them in order to make the subjects' answers more easily understandable. Therefore, we only highlight the most representative categories of answers.

The results show that most of the information searched for is academic information (40.3%), followed by information on current affairs (16.6%), sports (6.4%), varied information (5.4%), and entertainment (3.1%). The remaining 28.3% of the expressions identified, that corresponds to 28 categories, were integrated in the other category, each one of which with little representativeness and with a percentage of under 3% (Figure 1).

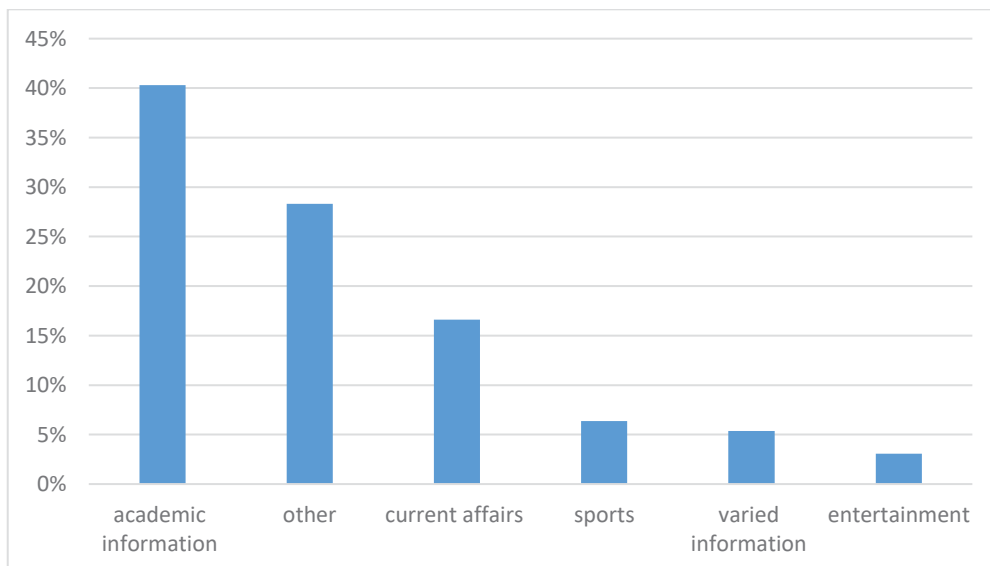


Figure 1: Kind of information that students usually search for on the internet

Among the 28 categories regarding the information searched for online, we highlight the categories concerning information related to the following: general knowledge, films and series, curiosities, doubts, weather forecast, information technology, politics, health, music, the environment, economics, literature, social networks, newspapers, shopping and places to visit.

In a nutshell, given the indicators found, the results show that the majority of the sample subjects frequently deal with the Internet and have been using it for some years. Also, the main information searched for online is related to the sample subjects' academic activity, current affairs and sports.

4.2 Undergraduates' perception of the attention given to social values and counter-values when communicating online

The undergraduates' perceptions regarding social values and counter-values when communicating online becomes more easily understandable when we know who they communicate with online.

In order to identify who the students communicate with online, the sample subjects were asked to answer the following question: 'Who do you usually communicate with online?'

By using each entity indicated by the students as an analysis unit, 820 units (expressions translating who the students communicate with) were identified from the answers given by the 724 sample subjects. The 820 expressions were integrated into four different categories denominated as friends, relatives, colleagues and others. We found that most of the online communications established by students are with friends (72%), followed by relatives (20%) and colleagues (3%). The remaining 5% represent the category others, made up of all the types of communication which could not be integrated in the other designated categories. Some examples of such types of communication are with the boyfriend or girlfriend, teachers and strangers.

In light of these results, it becomes particularly interesting to determine the attention students give to social values when they communicate online with colleagues, friends and relatives.

The indicators regarding the attention undergraduates give to values when communicating online were obtained from the answers given to three questions, one concerning their colleagues, another one concerning their friends and yet another one concerning their relatives, all of which can be synthesised as: 'When you use the Internet to communicate with colleagues/friends/relatives, do you take into account the values of: a) friendship, b) cooperation, c) creativity, d) honesty, e) equality, f) freedom, g) respect, h) responsibility, i) solidarity, and j) others. Which?'

Each respondent's answer admitted for each value the following options: never, few times, many times, and always. In order to facilitate the understanding of the data and compare the attention given by the subjects to social values when communicating with colleagues, friends and relatives, the qualitative data was transformed into quantitative values by means of the following coding: no answer given - 0, never - 1, few times - 2, many times - 3, always - 4. Thus, the classification of the attention given to social values by each one of the sample subjects ranges from 0 to 4, with zero being the minimum score and 4 being the maximum score.

By means of the process described above, it was possible to determine the mean of the scores given to each value and consequently, compare the attention given by the sample subjects to social values when communicating with colleagues, friends and relatives.

After the respective coding and interpretation, the data obtained from the students' answers to the given questions is presented in Figure 2.

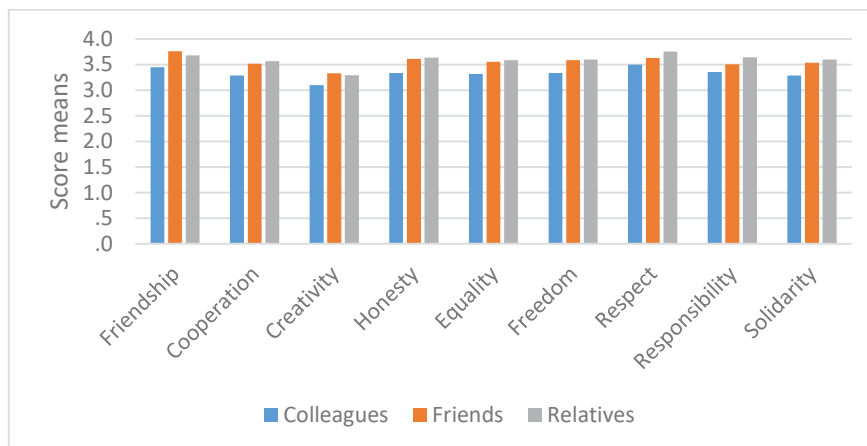


Figure 2: Distribution of the attention given by the undergraduates to social values when communicating online with colleagues, friends and relatives (n=724)

Given that the scale regarding the attention given to social values was defined with scores from zero to four, with 0 representing the minimum value and 4 the maximum value, the observation of Figure 2 enables the conclusion that all the sample subjects give attention to values when communicating with colleagues, friends and relatives either many times or always.

The results show that the undergraduates give more attention to each of the values analysed when they communicate with friends and relatives than when they communicate with colleagues. More attention is given to the value of friendship when communicating with friends than when communicating with family. More attention is given to the values of respect and responsibility when communicating with relatives than when

communicating with friends. With very close score means, similar attention is given to the values of cooperation, creativity, honesty, equality, freedom and solidarity when communicating with friends and with family.

By following preconditions and conventions similar to those used to determine the attention given by students to values when communicating online, we sought to obtain indicators regarding the students' perception of the presence of counter-values when communicating online. The indicators about counter-values were obtained from the answers given to three questions, one regarding colleagues, another one regarding friends and one more regarding relatives, translated into the following expression: 'In your online communication with colleagues/friends/relatives, do you identify the counter-values of: a) inequality, b) dishonesty, c) selfishness, d) disrespect, e) insecurity, f) irresponsibility, g) manipulation, h) oppression, i) violence, and j) others. Which?'

The distribution of the means obtained for each of the counter-values analysed according to the conventions defined is presented in Figure 3.

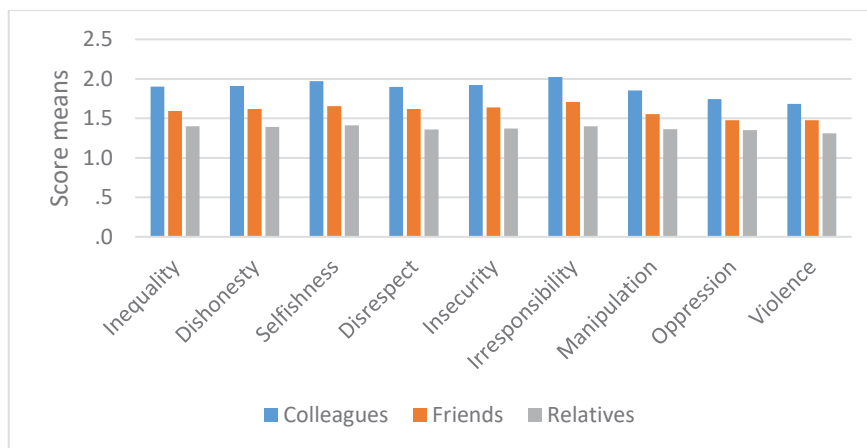


Figure 3: Distribution of the undergraduates' perception of counter-values when communicating online with colleagues, friends and family (n=724)

By observing Figure 3, it is visible that the identification of counter-values when students communicate online is quite frequent. The identification of counter-values is always higher in the communication with colleagues than in that with friends. It is also always higher when students communicate with friends than when they communicate with relatives.

The counter-values analysed were those of inequality, dishonesty, selfishness, disrespect, insecurity, irresponsibility, manipulation, oppression and violence. The most prominent were selfishness and irresponsibility when communicating with colleagues.

5. Conclusions

The main focus of this study was laid on the assessment of aspects regarding undergraduates' digital literacy as well as on the attention they give to social values and counter-values when communicating online. It is a mixed methodology study, assuming approaches from both qualitative and quantitative research. The data analysed was obtained by questionnaire in the academic year of 2016/2017, from a sample of 724 bachelor degree students attending two public higher education institutions, a Portuguese one and a Spanish one.

Among the main conclusions drawn from this study, we highlight the following:

- The number of years of Internet use by the sample subjects varies between one and 22, with a mean of 9 years and a median and mode of 10 years;
- The frequency of Internet use varies between two hours and 120 hours per week (7 days), with a mean of 31 hours, a median of 30 hours and a mode of 70 hours;
- The information that stands out as what the students search for online is academic information (40%), information related to current affairs (17%), information related to sports (6%), varied information (5%), and entertainment (3%). The remaining information searched online (29%) is related to various topics, each of them with little percentage representativeness, translated by expressions associated with general

knowledge, films and series, curiosities, doubts, weather forecast, information technology, politics, health, music, the environment, economics, literature, social networks, newspapers, shopping and places to visit.

- Most of the students' online communications are established with their friends (72%), followed by those established with relatives (20%) and those with colleagues (3%). All the other communications the undergraduates establish online represent 5% of the total of the communications established;
- For each of the social values analysed, the undergraduates give them more attention when communicating online with friends and relatives than when communicating with colleagues. With regard to friends, the value they give most attention to is that of friendship. When communicating with relatives, they give most attention to the values of respect and responsibility. They give similar attention to the values of cooperation, creativity, honesty, equality, freedom and solidarity when communicating with friends and relatives;
- The identification of counter-values when the students communicate online is quite frequent. The identification of counter-values is higher when communicating with colleagues than when communicating with friends and it is also higher in the communication with the latter than in the communication with relatives. The counter-values analysed were those of inequality, dishonesty, selfishness, disrespect, insecurity, irresponsibility, manipulation, oppression and violence, and the most prominent were those of selfishness and irresponsibility when communicating online with colleagues.

Digital literacy constitutes a current topic of major interest and social values constitute a topic which is always present in social interactions. Therefore, the association of topics such as digital literacy, digital competence, digital tools and social values always poses wide challenges in which each contribution only represents a small part of the great deal we need to research and understand.

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