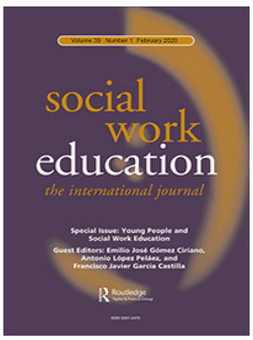

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Facebook groups as social intervention tools for improving digital skills

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ABSTRACT

Recent research has proven that Facebook groups are efficient tools that support learning and promote cooperation and social connectedness particularly amongst young graduates. The aim of this paper is to prove whether the acquisition of digital skills and the participation in Facebook groups improves the social connectedness, information outreach and resilience capacity of young Social Work graduates. We have observed social connectedness patterns on Facebook of 44 Social Work graduates from Malaga (Spain) through an experimental model and the analysis of social networking sites. We found an improvement in connectedness on Facebook, based on the participation in the group as well as an improvement of digital skills, which are key elements for the processes of digital inclusion. Finally, we found that the acquisition of digital skills correlates the resilience capacity of young graduates. Results show that digital skills modulate online connectedness and resilience.

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Facebook groups; connectedness; digital skills; resilience; digital inclusion

1. Introduction

Social networking sites appeared in the context of internet in 2004. In 2018, Facebook was the most used online network surpassing the symbolic figure of more than two billion users worldwide, with an average daily frequency of use of around two hours (Roth, 2018). This high frequency of use has made social networking sites parallel universes of socialization allowing connectedness and the generation of interactive dynamics that were unconceivable in the past. The most used online network, Facebook, enables five billion social connections in Europe (Filiz, Adamic, & State, 2016).

These possibilities of connection are transforming the way we communicate, keep in touch and the way society thinks. People, organisations and things are perceived as potentially connected to the network. The emergence of a new logic of connective action, based on sharing personalized content through online networks (Bennett & Segerberg, 2012), strengthens a 'basic mechanism to build power in the network society: the power of interconnection' (Castells, 2012, p. 29).

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*The data that support the findings of this study are available on request from the corresponding author, [JCDM]. The data are not publicly available due to restrictions, e.g. their containing information that could compromise the privacy of research participants.

1.1. Social intervention for young people in social networking sites from an educational social work approach

When social networking sites first appeared, they were predominatly regarded as positive. However, the current dystopian approach, which stresses the risks and dangers of social networking sites (overexposure, cyberbulling, phising, cyber-sexting, etc.), is now more prevailing. Yet, social networking sites can be benefitial for social intervention with young people as their use improves young people's mental well-being (Best, Manktelow, & Taylor, 2014) and reduces extreme suicidal behaviour (Dyson et al., 2016). The main positive impact of social networking sites is linked to a higher outreach of social capital (Castillo De Mesa, Gómez Jacinto, López Peláez, & Palma García, 2019). Therefore, they are being used as social intervention tools to support young people and particularly those who suffer from loneliness (Pittman & Reich, 2016) or are going through a difficult time (Trevithick, 2008).

From an educational approach, Facebook groups have proved to be efficient tools for social intervention due to their promotion of learning (Manca & Ranieri, 2016), cooperation (Meishar-Tal, Kurtz, & Pieterse, 2012) and the improvement of social connectedness (Barczyk & Duncan, 2013). Participating in Facebook groups is linked to higher social connectedness (Hurt et al., 2012). Social Work shares with social networking sites its main objective, that is, to build relations. Social Work cannot ignore the scope of these tools, particularly regarding the increase of socialization in social networking sites. As learning communities, Facebook groups also help young people, and in this particular case Social Work graduates, to develop a higher sense of community committment (Junco, 2012).

1.2. Digital skills in young people regarding the use of social networking sites

The use of social networking sites by all sectors of society is significantly high, however, it is particularly extensive when it comes to young people (Duggan & Smith, 2013). Young people have grown up surrounded by these technologies to such an extent that they are already being called 'digital natives' (Prensky, 2001). However, we must take into consideration that young people do not constitute a monolithic group with universal talents for the use of these digital means. On the contrary, the use they make of technology is highly diverse (Selwyn, 2009). The use of social networking sites is an emerging phenomenon and as such, young people started using it spontaneously to communicate with their friends (Wang & Edwards, 2016) and develop new relationships (Levine & Stekel, 2016). Yet, there is a lack of information from which to raise awareness about the impacts which certain types of use can imply.

Such lack of information and reflectivity is causing certain types of deviant social connectedness behaviours. The lack of awareness regarding the use of these digital means can lead to disadvantages, particularly amongst those less skilled. The level of digital skills of a person determines the access to resources, thus empowering those who have the appropriate skills and leaving behind those who do not have the skills to benefit from all the potentialities of social networking sites (Dijk, 2006).

Digital skills are perceived as 'the ability to respond pragmatically and intuitively to the challenges and opportunities in a way that the Internet is used at its most potential'

(DiMaggio, Hargittai, Celeste, & Shafer, 2004, p. 378). They are also understood as 'the user's ability to locate content in the world wide web in an effective and efficient manner' (Hargittai, 2005, p. 372). There are different levels to analyse and conceptualize digital skills. One of these levels focuses on operational skills (Steyaert, 2002), that is, those skills that relate to the use of interactive applications and devices. Dijk (2005) defines digital skills as those skills used to make use of computers—currently smartphones too—and linked hardware and software networks. Another of these levels of analysis, beyond the use of services and applications, focuses on the user's ability to filter information (Marchionini & White, 2007). This is related to the information level of digital skills, which implies knowing how to look for information using online applications and services. Van Dijk (1999) already noted the importance of developing skills to find, assess, process and apply information in an environment with overabundance of information sources. He anticipated the current problems of 'infoxication and infosaturation' (Dias, 2014), which derive from the difficulty to manage the massive and ongoing flows of information and news spread throughout the Internet.

Digital skills for seeking information develop when users try to satisfy their needs for information (Jenkins, Corritore, & Wiedenbeck, 2003). At present, when looking for information on the Internet, it is very common to find data that strengthens our own beliefs. Digital means suggest users content based on previous behaviours as well as their digital fingerprint after using web browsers (Nikolov, Oliveira, Flammini, & Menczer, 2015). Therefore, users end up using filters linked to their own behaviours on the Internet, whether they are aware or not.

The same features apply to social networking sites, in which users receive information from those users who they decide to follow, whilst the information and opinions from those users they do not follow is therefore missed (Nikolov et al., 2015). Users tend to be surrounded by people who share similar understandings about the world and this can increase tribal mindsets and degrade the quality, security and diversity of online content (Gillani, Yuan, Saveski, Vosoughi, & Roy, 2018). It also leads to a narrow perception of the world around us, that is, a limited set of points of view that hinders the interaction of users' own ideas with new ones, thus leading to 'filter bubbles' or 'echo chambers' (Pariser, 2011). These bubbles imply redundancy in content and relationships and lead to monolithic information and knowledge on the Internet limiting users' pre-reflective abilities (Han, 2014). This phenomenon causes the so-called confirmation bias (Nickerson, 1998), which causes less informed opinions and a breeding ground for disinformation.

In order to tackle these information biases, strategic digital skills are required. On the one hand, those skills that relate to the ability to use information strategically aiming at a specific goal, and on the other, digital connectedness skills, that is, those skills that lead to strategic relationships, improvement of the access to information and, thereby, social position.

Finally, formal digital skills relate to the ability to manage the profuse quantity of means available, also known as 'hypermedia' (Lee, Cheng, Rai, & Depickere, 2005).

1.3. Resilience in social networking sites

Reaching a universal definition of resilience is complex, however, we may refer to it as the ability to overcome and recover from adversities allowing successful adaptation,

thus increasing the development of social, academic and vocational skills (Rirkin & Hoopman, 1991). Resilience is considered to be a protective ability that is found in individuals in the form of a state, rather than a feature, thus being modifiable (Connor & Davidson, 2003). It emanates from continuous interaction with the environment in which individuals develop and socialise (Vanistendael & Lecomte, 2002). When students are in their last academic year, they face a change that implies high levels of uncertainty and emotional crisis in some cases. In this sense, social relations in online environments may be a significant indicator for successful adaptation (Masten & Tellegen, 2012). Weller and Anderson (2013) in their application of resilience to education argue that resilience develops commitment, education, empowerment and courage while technology offers outreach, usability, accessibility and feedback, thus developing resilient higher education processes.

For this reason, the present paper aims at verifying whether higher online connectedness can increase resilience, particularly when the necessary digital skills are acquired. We consider Facebook groups to be potentially appropriate digital tools that can make users achieve strategic goals through connectedness.

2. Methodology

2.1. Participants

We developed a social experiment at the Faculty of Social Studies from the University of Malaga (Spain). 44 Social Work graduates were gathered in an online group created on Facebook, due to being the most used social networking sites by the majority of students. The basis for the selection of participants was that they had shared their academic stages during the four years of the Social Work study programme.

2.2. Design and procedure

The aim of the experiment was for participants to be in a common space from which to connect, share information and support each other in the process of searching information. Despite the fact that participants knew each other, the aim was for them to break their usual closed circles and create new networks in order to generate higher aperture and tolerance to diversity by exchanging information collectively. During the process, participants were called to attend some workshops in which they were informed about the objectives of the social experiment. In order to comply with ethical requirements, we followed the premises of social work in technological environments by Reamer (2013), for which their informed consent was requested for the information obtained to be used for research purposes and through a neutral Facebook profile that would serve as a facilitator to avoid mutual personal interferences.

2.3 Methods and techniques

Different techniques and methods were used in order to analyse online content. Most of the methods were developed by the Gephi software (Bastian, Heymann, & Jacomy, 2009), in its version 0.9.2. This software was first launched in 2008 and it is defined as

a platform for interactive display and network use, complex systems and dynamic and hierarchic graphs. Likewise, it allows the management of broad networks, thus overtaking the limitations of similar software. The SPSS V20.0 software was also used, given its ability to test correlations statistically.

2.3.1. Social network analysis

The features of the *online* social structure observed were analysed and different relational properties were measured in order to carry out the analysis of social networking sites. Firstly, the centrality of degree was observed, which is conceived as the number of actors to which another actor is directly linked (Freeman, 1979). The centrality of degree analysed in an online context is called social connectedness, defined as computer assisted communication—currently also performed by smartphones—that involves the development of personal bonds (without common geographical constraints) and connecting with wider groups and communities of interest (Wellman, Haase, Witte, & Hampton, 2001).

The level of users' degree was also analysed as a relational feature. This feature determines the number of intermediaries needed to connect all users (Freeman, 1979). It determines which actor is amidst geodesic paths and, therefore, indicates the shortest way that any actor needs to follow in order to reach any other actor within the network. Holding this position enables to control information, that is, being in the middle of these paths allows to strategically retain or spread information based on actors' interests. The level of betweenness centrality indicates the number of times an actor appears in the geodesic paths (shorter paths) of two actors in the network. Based on this information, it can be detected through which nodes an actor needs to pass in order to reach other nodes, as well as which actors are bridges between nodes and hold a strategic position within the network. Finally, the eigenvector centrality was analysed, a measure that indicates the relevance of a node in a network based on the connections such node has.

For the analysis of cohesion, the measure of closeness centrality was taken into account, which is defined as the average distance from one node to all the other nodes in the network. Closeness indicates the average distance of an actor from the other actors, focusing on geodesic distance (Freeman, 1979), that is, the shortest path that an actor must follow in order to reach all the other actors in the network. Therefore, the inverse of the addition of an actor's distance with regard to all other actors is considered as closeness. It is not a physical distance, but the number of necessary leaps that must be performed so as to reach each other actor.

Likewise, transitivity is a measure that indicates if, in the context of several relations, it is possible to expect that when A and B have a relation, and so do B and C, A may also have a relation with C. When networks have high levels of this type of triads, they tend to create structures with nodes that are highly embedded. In other words, it proves the algorithm that the friend of my friend is also my friend to be true. This fact affects the level of connectedness among nodes. In order to finalize the analysis of cohesion, the density of the network was considered. Such density represents the proportion of all the bonds that must be theoretically present (Wasserman & Faust, 2013).

2.3.2. Questionnaire

For the purpose of analysing digital skills we used the digital competence scheme defined by the Digital Agenda (European Commission, 2016). This scheme was combined with

Table 1. Correlations, descriptive statistics for the study of variables.

	Digital Skills	Resilience	Mean	SD
Degree	.212	.266	21.386	8.255
Betweeness	.296	.395	12.182	14.667
Eigenvector	.205	.243	.637	.225
Transitivity	.251	.257	160.841	94.270
Closeness	.234	.287	.667	.087
Mean	7.818	38.704		
SD	4.127	4.603		
Cronbach α	.890	.792		

the latest official definition of competences and skills of the Social Work Undergraduate Degree in Spain, more specifically those which are related to the instrumentalization of resources, the capacity to provide information and the establishment of networks (Aneca, 2004). The digital skills scale has 13 items that are answered with yes or no. Then, a total mark is calculated, ranging from 0 to 13. Descriptive statistics are shown in Table 1. The scale has high internal consistency with Cronbach' α = 0.89.

The study of resilience was performed through the 10-item Connor-Davidson Resilience Scale (CD-RISC 10) (Davidson & Connor, 2018). This scale includes points 1, 4, 6, 7, 8, 11, 14, 16, 17 and 19 of the original scale (Connor & Davidson, 2003). This scale is broadly used to analyse resilience with higher education graduates and it includes specific aspects related to information outreach and the creation or possession of networks, which together help to overcome adversities. Participants answer each item in a 5-step Likert scale and a single resilience index is calculated. Its descriptive statistics are shown in Table 1. This scale has also good internal consistency, Cronbach' α = 0.79.

3. Results

In the following sections it is proven how the initial hypothesis is supported by the results achieved.

3.1. Structural properties

The results of the analysed relational features defined the morphology of the network. It should be remembered that the analysed structure is a socio-centric network, that is, a network in which all actors can reach each other since they belong to the same context, which in this case is a Facebook group. The group was composed of 44 nodes and 815 ties. The centrality of degree varied from zero contacts to a maximum of 44. Figure 1 shows those nodes that stand out in connectedness and which are identified by stronger colour tones and bigger size. The average centrality of degree reached 18 contacts. Ties between participants were increased by 21% after the experiment. This shows a very high progressive social connectedness tendency. Such average increase of participants' connectedness enabled the increase of the average access to information in the same proportion. Regarding the intermediation degree of participants, we noted that some nodes, the ones called 'bridges', show a remarkable level of betweeness centrality. They can be identified by their size and darker colours in Figure 2.

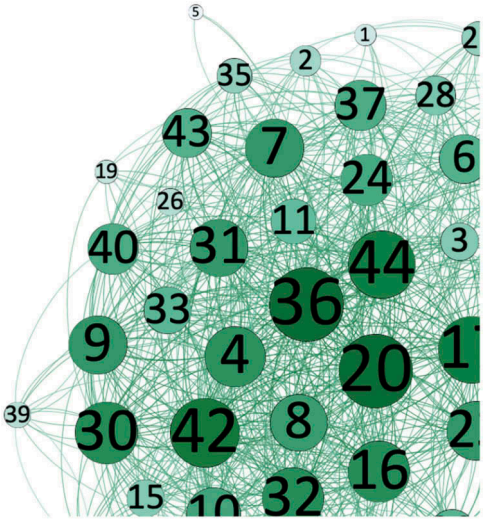

Figure 1. Degree Centrality (Freeman, 1979).
Source: Gephi (Bastian et al., 2009).

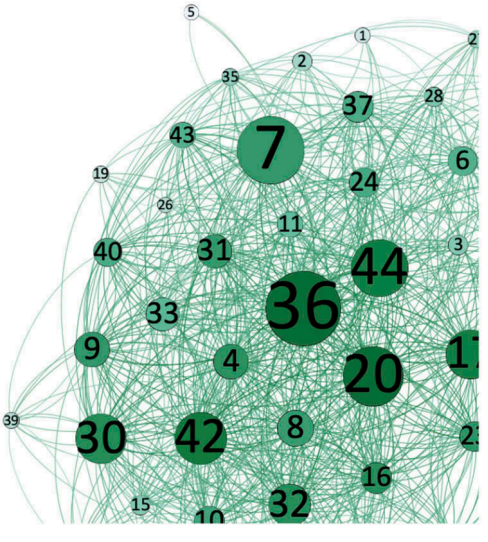

Figure 2. Betweeness centrality (Freeman, 1979).
Source: Gephi (Bastian et al., 2009).

3.2. Social cohesion

The closeness centrality measure evinces the social distances separating users. The maximum social distance between any pair of nodes was 3. The average distance was 1.6 leaps. The total triads reached were 810. Likewise, the average density was 0.6. These values, which vary from 0 to 1, reached high levels respectively. Hence, they prove the cohesion levels of the analysed structure.

Table 1 shows the descriptive statistics of the research variables, as well as the correlations between variables regarding the positions held in the network (degree, betweenness and eigenvector) and the cohesion variables (closeness and transitivity) with regard to digital skills and resilience. It can be observed that all relations are positive and not very high. The correlations between each variable in the network and resilience are particularly interesting, because their increase matches the increase of all of them. In order to see the modulating effect of digital skills on these relations multiple moderate regressions were performed. These analyses were conducted using the process toll in SPSS V20.0. All variables were standardized.

Table 2 shows the results of moderate regression analyses, with the centrality position variables (degree, betweenness, eigenvector) as independent variables, digital skills as moderator and resilience as dependent variable. It can be observed that the first regression equation, with degree as an independent variable, has little explanatory power, as well as the moderating effect of the digital skills, which is also little. This moderating effect is shown in Table 3. The effect of degree on resilience is minimum when digital skills are low, it increases when these are average and it becomes stronger and statistically relevant when they are high (p = .02).

When betweenness is used, regression is statistically significant; betweeness increases resilience and the modulating effect of digital skills is very low, despite having the same sense as the degree variable. The eigenvector effect on resilience is higher and, in this case, the moderating effect of digital skills is also higher than the previous ones. As it happens with the first variable, digital skills modulate steeply the relation between the eigenvector and resilience, thus increasing it when digital skills are higher (p = .02). In general, we observe that centrality position variables increase resilience when digital skills are high.

The results of the moderating regression analyses are shown in Table 4, with cohesion variables (transitivity and closeness) as independent variables, digital skills as moderating variables (moderator) and resilience as an independent variable. It can be observed that the first regression equation, with transitivity as independent variable, has

Table 2. Regressions analyses testing the moderating effects of digital skills in the relationship of independent variables (centrality positions) to resilience.

	VI = Degree				VI = Betweeness				VI = Eigenvector			
	Coeff.	*SE*	*t*	*p*	*Coeff.*	*SE*	*t*	*p*	*Coeff.*	*SE*	*t*	*p*
Constant	−.05	.15	−.34	.73	−.04	.15	−.26	.80	−.05	.15	−.35	.72
Digital Skills (DS)	−.08	.15	−.51	.61	−.13	.15	−.87	.39	−.07	.15	−.47	.64
VI	.22	.16	1.41	.17	.36	.18	1.98	.05	.20	.15	1.34	.19
VI x DC	.24	.15	1.66	.10	.14	.17	.77	.44	.26	.14	1.83	.07
	R^2 = .14 F = 2.08 p = .12				R^2 = .19 F = 3.05 p = .04				R^2 = .14 F = 2.08 p = .12			
	ΔR^2 interaction = .060 F = 2.77 p = .10				ΔR^2 interaction = .01 F = .60 p = .44				ΔR^2 interaction = .07 F = 3.34 p = .07			

Table 3. Conditional effect of VI (centrality positions) on resilience at values of the digital competence.

	VI = Degree				VI = Betweeness				VI = Eigenventor			
Digital Skills	*Effect*	*SE*	*t*	*p*	*Effect*	*SE*	*t*	*p*	*Effect*	*SE*	*t*	*p*
Low	−.03	.24	−.11	.91	.22	.31	.71	.48	−.06	.23	−.25	.80
Medium	.22	.16	1.41	.17	.36	.18	1.98	.05	.20	.15	1.34	.19
High	.46	.19	2.49	.02	.49	.17	2.97	.01	.47	.19	2.46	.02

Table 4. Regressions analyses testing the moderating effects of digital competence in the relationship of independent variables (cohesion) to resilience.

	VI = Transitivity				VI = Closeness			
	Coeff.	*SE*	*t*	*p*	*Coeff.*	*SE*	*t*	*p*
Constant	−.06	.15	−.40	.69	−.05	.15	−.33	.74
Digital Skills	−.09	.15	−.59	.56	−.09	.15	−.58	.57
VI	.22	.16	1.43	.16	.24	.16	1.55	.13
VI x DC	.24	.15	1.59	.12	.22	.15	1.43	.16
	R^2 = .13 F = 1.95 p = .14				R^2 = .13 F = 2.05 p = .12			
	ΔR^2 $_{\text{interaction}}$ = .06 F = 2.54 p = .12				ΔR^2 $_{\text{interaction}}$ = .04 F = 2.06 p = .16			

Table 5. Conditional effect of VI (cohesion) on resilience at values of the digital competence.

	VI = Transitivity				VI = Closeness			
Digital Skills	*Effect*	*SE*	*t*	*p*	*Effect*	*SE*	*t*	*p*
Low	−.02	.24	−.08	.94	.03	.25	.11	.91
Medium	.22	.16	1.43	.16	.24	.16	1.55	.13
High	.47	.19	2.41	.02	.46	.19	2.48	.02

little explanatory power and the moderating effect of the digital skills are also low. This moderating effect is shown in Table 5. The effect of transitivity on resilience is minimum when digital skills are low, it increases when it is average and it becomes stronger and statistically significant when it is high (p = .02).

The effect of closeness on resilience is similar, as well as the moderating effect of digital skills. As it happens in the previous cases, digital skills modulate steeply the relation between closeness and resilience, thus increasing it when the digital skills are higher (p = .02). In general, we observe that cohesion variables increase resilience when digital skills are high.

4. Discussion

It has been proved that Facebook groups, when used strategically, can boost the social connectedness of its members. They are appropriate socialization tools that improve strategic digital skills and connectedness. From the point of view of cohesion, Facebook groups allow better flows of information when they are close structures with high levels of transitivity. Likewise, they are powerful tools to generate greater aperture and better access to information, because higher outreach of connectedness enables higher outreach of information. This promotes higher density in networks and enables to break usual closed circles that generate echo chambers. From a strategic approach, it can be observed that the intermediation centrality enables to access more information and even be able to control it (Burt, 2005).

Furthermore, when connectedness is strategically addressed towards achieving a specific goal, it can boost digital identity and improve the social status. Both variables are built in relation to other people. In this sense, social connectedness suggests a type of social capital that generates opportunities. This implies to overcome the second level of what is known as digital divide (Hargittai, 2005). To promote strategic connectedness capacities through educational Social Work is crucial, as it enables students to understand how digital tools can be used in social intervention within digital inclusion

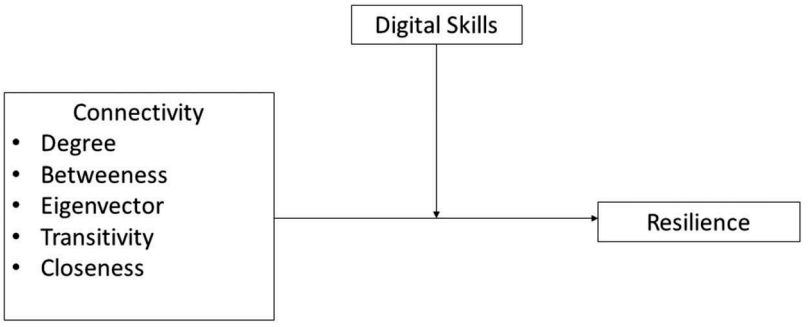

Figure 3. Modulating effect of digital skills on the relation between social connectedness and resilience.

processes. Mainly due to the fact that the new uses and motivations to use social networking sites are linked to the essential aim of Social Work, that is, the strengthening of relations (Cottam, 2015).

As regards the relation between connectedness and resilience, Figure 3 shows the observed tendency. Social connectedness is a good predictor of an increase in resilience, but its effect is only truly relevant when social work graduates have high digital skills provided by their studies. At a higher or lesser extent, this effect is observed in all variables.

In this sense, several authors have evinced that digital skills have a great impact on the numerous and complex activities carried out in the Internet (Livingstone & Helsper, 2007). The processes of digital education and inclusion are more and more dynamic. Once access problems are solved, new digital gaps appear. Our study confirms that connectedness digital skills are a relevant factor in the process of digital education and inclusion that allow to increase the outreach of information and contacts. It also shows that digital skills are essential to modulate the relation between connectedness and resilience capacity.

5. Conclusions

Initially, utopian approaches prevailed in the narrative about the use of social networking sites, understood as services that provided opportunities and considered as tools that enable the creation of social movements and the democratization of the access to information. In opposition to this approach, there is a dystopian approach that has grown stronger in recent years, in some cases it is even an apocalyptic vision, about the negative effects of using social networking sites, due to the consequences involved in its use, particularly concerning the loss of privacy, an increase in surveillance and control of behaviours, polarization, overexposure and excess of unreliable content (Han, 2014). The constant bombing about the negative effects of using social networking sites carried out by the media are increasing the feeling of being watched, which is leading to some kind of inhibition and even self-censorship of interaction (Das & Kramer, 2013). As a result, the option of not participating is starting to spread (Harari, 2018). However, if people don't participate, it means they are on the other side of the digital divide (Blank,

2013) and involves not only leaving behind certain prejudices and risks but also opportunities in terms of social connectedness, access to information, interaction and empowerment (Shirky, 2008).

Beyond the opinion that is being spread by the media, academic literature has reached some consensus about the impact of online communication on wellbeing, which depends on individuals' aims, the nature of the communication exchange and the closeness with other nodes (Burke & Kraut, 2013). From this approach, which focuses on the importance of use, of the 'for what purpose', we suggest that the digital divide responds to the type of use citizens do based on their digital skills (Deursen & Dijk, 2009). As noted by academic research and main academic institutions (National Association Social Work, Association Social Work Boards, Council Social Work Education, Clinical Social Work Association [NASW, ASWB, CSWE & CSWA] 2017) are encouraging social workers to use technological means to find solutions to social problems and empower citizens through the access to information and improve their relationships. Social Work must leverage these means to place them at the disposal of citizens and digital inclusion processes.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

Joaquín Castillo de Mesa, Ph.D he has been an associate professor in the Department of Social Work at the University of Málaga (Spain) since 2010 and a member of Research Group of Quality of Life and Community and Organizational Intervention. He has been a Visiting Scholar at UC Berkeley, and at Anglia Ruskin University. His publications include analysis of social innovations, detection of communities, mining data from Big Social Data and combining analysis social networks and different algorithms for applying the results to social intervention.

Luis Gómez Jacinto, Ph.D he earned his B.S. in Psychology at the University of Salamanca and his Ph.D. at the University of Málaga (Spain), where he has been a Full Professor of Social Psychology since 1999. He has directed numerous dissertations and is the author and coauthor of several scientific publications related to Social Psychology. Currently, he is a professor in the Department of Social Studies and Work at the University of Málaga. His research is centered on the application of the theory of evolution to the analysis of psychosocial processes as well as social and community intervention.

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