Use and assessment of general-interest social networks and academic databases in Galician universities

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Abstract
Introduction: This article examines the knowledge, use, assessment and impact of the social networks Facebook and Twitter and bibliographic databases among the Teaching and Research Staff (TRS) of three Galician universities. **Methods**: The study is based on a survey conducted among a sample of 463 respondents selected from a universe of 5,498 professors and researchers. The survey has a margin of error of 5% and a confidence level of 95%. **Results**: 50.2% of the TRS considers that Facebook and Twitter are suitable for teaching and research while the remaining 49.8% thinks otherwise. Scopus and Google Scholar are the most known and used databases, with percentages above 80% and 60%, respectively, while EBSCO and EMBASE are the least known. **Discussion and conclusions**: There is significant knowledge and use of academic databases, but the opinions regarding the suitability of Facebook and Twitter for teaching and research activities are very divided.

Keywords

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1. Introduction

Year after year university students from all over the Western world change their faces, appearance, clothing, style and the tools they carry in their folders and backpacks. In this sense, students are bringing less and less paper books and notebooks to class. The reading and consultation of printed documents is also decreasing, in contrast to the massive and instant use of Google and Wikipedia. This change in the uses of didactic tools in the classroom has been remarkable in the last three or four years.

What has not changed, however, is the classroom's lights, window blinds, tables and chairs -some of them damaged- nor the chalkboards that still illustrate the teachers' presentations. However, the personal computer and connective environment that dominates among students is quite different. Laptops, tablets and smart phones are predominant. Students use most of these devices to follow their teachers' presentations and to carefully monitor the messages their friends and idols post on social networks.

Many students stay online in their social networks and interact in them while the teacher gives the class. Some of them take notes in the main computer window but keep Facebook, Twitter, Instagram and Snapchat open in other minimised windows. Young audiences do not only carry out multi-screen consumption for media contents but also for many of their other everyday social practices, including class-taking and study. Students' attention to conversation on social networks is combined with the learning of theories and concepts in class in a kind of educational and communicational "collage", "remix" or "mash-up" (Manovich, 2007).

Faced with this learning environment of our classrooms, the reactions among the faculty ranges from bewilderment, inability, impotence, prohibition, rejection, hysteria, nervousness, inhibition, passivity and a search for alternative strategies to recover students' full attention through the incorporation of these new tools to the teaching process. It is not easy to do so or to face the new technological reality -unless teachers opt for the radical solution of prohibiting the use of technological devices and Wi-Fi in the classrooms- because the learning society (Stigliz and Greenwald, 2016) in which we are immersed cannot get disconnected from the connective environment in which students live.

Teachers, like most people, assume that social networks are a new form of connectivity for current sociability. If each of us are aggregated and use social networks with more or less regularity in our daily life, we have no logical arguments to get mad when our students use them with so much joy. What we still do not know well is how to use them and implement them properly in our relations with students. Not only as part of the didactic activities, but also of the mentoring, scientific research work and the global relation with the society to which we owe our social role of mediators of knowledge and learning.

Based on these premises, the objective of this research study is to know how the Teaching and Research Staff (TRS) use and assess the general-interest social networks that are used by our students in the classroom, on the street and at home. In this case, the object of study are not specifically the thematic scientific networks, which connects many teachers and few students, but the general-interest networks through which our students get connected, converse and interact. Another objective is to know how and to what extent teachers use other digital tools, such as general-interest or specialised search engines/databases and other information management tools.

This research is contextualised with quantitative data -collected between January and April of the current academic year- on the number of TRS of the three universities under study who are in the major networks and the institutional opinion on this matter of the representatives of the vice-chancellorships and areas of educational training and innovation of these university and the data on the education courses they have on offer. These are the objectives of this research, whose universe of study encompasses a group of more than 5,000 professors from three universities of Galicia, whose results could represent the average prototype of the current Spanish university professor. The fact is that social networking sites are increasingly more present in society, universities and classes, but are we taking advantage of them properly or are we just surrounded by them and trying to navigate to avoid being cast away?

2. Educational use of social networks

The direct observation of the behaviour of students allows us to confirm the intensive ludic, relational, and informational use of general-interest social networks, as well as their timid introduction in teachers' teaching and practical dynamics with their students, despite the acceptance of their importance. The state of the research confirms this idea, based on the recognition of social connectivity, the interest in their professional introduction, their essential role in distance education, the dissemination of new experiences of networks in classrooms, the opening of the gates of open science, the use of academic networks, the emergence of new scientific metrics and the usefulness of ORCID type digital identifiers.

The open and collaborative model of social networks is a revolution within the formal structures or the "rigid ivory towers" of the traditional university system that presents a great opportunity for a more horizontal, dynamic and intensive relationship between teachers and students in new environments that enrich the contemporary formation of the symbolic realm (Georgescu and Popescul, 2014; Núñez-Gómez and García-Guardia, 2010). This social connectivity between teachers and students (Bhagat, Wun and Chang, 2016) enables the reduction of the distance in the formal perception of teachers, beyond their master classes and the conventional system of assessments, establishing a "third way to reinforce the real work through a new intellectual

relationship" (Carney, 2010), in line with the new educational systems and the recommendations of the European Higher Education Area (EHEA).

The most restless and innovative teachers introduce social networks not only to communicate with their students, but also to capture their attention in class, which is one of the major concerns and problems in the current situation. Through Twitter and mobile phones some teachers encourage students to post questions on the electronic walls or the Power Point presentations to be answered immediately to the speed of a tweet, in order to solve the problem of lack of concentration or distraction with respect to other networks (Kim, Jeong Ji *et al*. 2015). These are pioneering and innovative experiences because research has shown that students use networks preferably to interact with their mates and teachers (Viassone, 2014).

For obvious reasons, the introduction of the use of social networks is more intensive in distance education and in the transformation of the figure of the professor into a monitor or tutor of learning, or rather e-learning, communities (Dumitrache, Gheorghe and Moldovan, 2014). In face-to-face teaching and the general field of education the need to implement new tools has generated demands for digital literacy (Georgescu and Popescul, 2014) and for the creation of thematic educational networks for faculty training (Diaz, Vázquez-Martínez and McMullin, 2014), which have not been properly met yet. The character of initiatives in these areas has been more individual and voluntary than general and institutional.

However, the proliferation of digital tools and the propagation of MOOC (Massive Open Online Courses) has been exponential in recent years; just like the use of YouTube videos and teaching simulators (Sergio, Navarro and Bernal, 2014), both in formal education and the self-taught everyday practices of this new socio-technological age in which people combine learning and experiences through the available technologies (Kubatova, 2012). We could also say that the institutional educational plans and practices have been overwhelmed by the penetration of the new information and communication technologies.

In the same way, online social networks have become an important complement to the development of the professional profiles for the future employability of students, since they are more and more used by recruiters in staff selection processes (Roulin and Bangerter, 2013). Some research recently carried out on labour and professional relations (Zhitomirsky-Geffet and Bratspiess, 2015) indicates that Facebook and LinkedIn are equally useful, although the latter is more effective in job searching. Meanwhile, academic and research dissemination networks as well as other useful teaching and research tools such as search engines, digital identifiers (ORCID, the Open Researcher and Contributor ID, and DOI, the Digital Object Identifier) and the indicators of scientific reputation are very useful for professors.

Scientific social networks are meta-media platforms (evolved computer and communication media) that function as ecosystems of interaction through public and semi-public profiles of affiliation that people use to disseminate their own publications, to follow the publications of colleagues, to get open access to millions of articles and works, to curate scientific contents, to interconnect with constellations of searches and filtering applications, to develop conversations and relationships of collaboration for research, to apply artificial semantic intelligence devices, crowd-review and social-review systems, to offer teaching vacancies, to manage digital identity, to calculate rankings and

indicators of academic reputation, as well as to offer other new digital meta-services (Boyd and Ellison, 2007; Campos, 2015).

The management of scientific information gradually went from the static archives of libraries to the digitised repositories as well as the online search engines and from these to reference management tools (EndNote, Zotero, CiteULike), to the digital object and identifiers (DOI and ORCID, created in 2000 in 2012, respectively) to the almetrics or new data metrics (Álvarez-García, Gértrudix-Barrio and Rajas-Fernández, 2014), to general-interest digital social networks (MySpace, Facebook, Flickr, YouTube, Twitter), which emerged between 1999 and 2006, and to other more specialised and thematic networks (LinkedIn, launched in 2003, and Mendeley, ResearchGate and Academia.edu, launched in 2008).

Bibliographic databases derived from the concentrated management of the catalogues of scientific and specialised journals for their direct marketing to universities and libraries around the world. This began with EBSCO (Elton Bryson Stephens Company) in 1944 in Alabama (United States), and EMBASE, which is owned by the Dutch Elsevier, with 28 million items of 8,400 journals, published since 1947, about medicine and pharmacology. The latter was sold in 2010 to the American Omnicom. They also coexist with online databases and services managed by national institutions, such as MEDLINE and PubMED, the U.S. National Library of Medicine.

The two global giants that control most of the scientific publications and journals are the North American Thomson Reuters and the Dutch Elsevier. Both have tried to combine the transition from the printed to the digital model, while preserving their own specialised information distribution platforms. Thomson is the parent group of the online scientific information service ISI Web of Knowledge (WOK), whose Web of Science (WOS) contains more than 8,700 journals of science, technology, social sciences, arts and humanities, as well as over one hundred thousand conferences proceedings (ISI Proceedings) since 1945. The coverage of Scopus, owned by the Elsevier Group, dates back to 1966 and integrates 22,000 titles from more than 5,000 publishers.

The philosophy of the specialised databases moved with all their intensity to the Internet in the mid-1990s through the creation of search engines: Alexa of Amazon (1996), Ask.com (1996), Sohu of China (1996), Trovator of Spain (1996), Yandex of Russia (1997), PubMED (1997), Google Search (1997), MSN Search (1999, then Yahoo! Search and then fusion with Bing), Baidu of China (2000), and Cuil (2006), among others. Three quarters of global searches on the Internet (in the European economic area, 90%, according to the CEE, 2016) are captured by Google, which has also attacked the specialisation of WOS and Scopus search engines through the adoption of its own indicator: the Jorge Hirsch's H-index of scientific reputation in 2009 (De Pablos, Mateos and Túñez 2013). Google uses 200 factors in its ranking algorithm, although its hierarchy system gives priority to Page Rank (PR), title, abstract and URL, which imposes personal and institutional strategies of SEO for a proper management (Cheng-Jye *et al.*, 2016). Then, the scientific social network ResearchGate, created in 2008, introduced another indicator, the RG Score, to assess the popularity and quality of the interactions of scientific papers.

The competition faced by the specialised databases and search engines of WOS and Scopus, despite their exclusive catalogues of journals and the traditional reputation indicator systems, require them to evolve to the rhythm of technological innovation, by introducing new services of continuous alerts, profile management, didactic monitors, digital identification systems that have been created by

themselves (ResearcherID of WOS in 2008) or have been adopted by Scopus (Open Researcher and Contributor ID, 2012), information management tools (such as Thomson's EndNote) and the acquisition, in 2013, of the Mendeley social network, created in 2007 by Elsevier.

The use and management of the digital space in the teaching environment requires the development of purpose-created tools as well as strategies and meta-languages. They are resources and competencies which, to a greater or lesser extent, are being incorporated in both the academia and ordinary social life. The management of profiles, identities, metadata, search engines and digital social bookmarking are fundamental aspects that are not always managed in the most efficient way.

There is no accurate global statistical data, but most of the knowledge in the world today is managed through digital resources and the promotion of the so-called open science or science 2.0 is getting stronger (Nosek, 2012; Ortega, 2015; Tanksalvala, 2016). Some recent research works (Jamili and Nabavi, 2015) indicate that 61% of academic searches on Google correspond to articles in open-access, especially in the field of life sciences. Another research study from the University of Colorado (USA) has empirically showed that the articles published in open access journals get more citations than subscription-based publications (Barker, Johnson, Michaelson, Stucky, 2014).

The debate on the concept of open science is directly linked to the management of intellectual property, the digitalisation of knowledge, their business models and technologies of disruptive innovation (Christensen, Raynor, and McDonald, 2015) introduced by the Internet and the Web 2.0. Scientific journals give recognition to the "invisible colleges" (Crane, 1972) of knowledge dissemination through reputation accreditation systems, based on specialised peer review and reputation metrics. Around this system there are large knowledge management and publishing groups (Thomson and Elsevier, with annual turnover of more than 20,000 million dollars), journals, databases, reputation indicators, search engines and digital networks. There are hundreds of databases but their relevance and usefulness is directly related to the copyrights and specialisation given in the access to data.

The digitalisation of archives and their interconnectivity is the first link that breaks in the value chain of the closed business model of knowledge management. The model of intellectual property, based on the publisher's copyrights and inventor's patent, ceases to be efficient because the digital innovation (Kotsemir and Meissner, 2013) jumps the barrier of accessibility without control protocols that maintain their traditional monetisation, according to which journals and database companies maintain payment subscriptions. The disruption of these models is accelerated through the collaborative culture of the digital convergence (Jenkins and Deuze, 2008) and the Web 2.0 tools that release millions of digital files, giving way to new open models such as Wikipedia and the scientific social networks.

The proper use of digital identities and profiles increases visibility and the exchange of ideas between academics and researchers. Most researchers still do not manage their academic profiles in an efficient, careful, updated and complete way, according to a study by the University of Bergen (Mikki, Zygmuntowska, Gjesdal *et al*., 2015). Studies on collective intelligence and social search have identified the behaviour patterns and the taxonomies centred in the user (McDonnell and Siri, 2011). This information is the basis for the articulation of the architecture of scientific meta-communication. The mechanisms that enable that relationship of accessibility are the repositories,

databases, search engines and networks of value and reputation that intervene in the smart management of information.

Due to obsolescence, lack of interoperability and the need for greater convergence, there is still no unified or unanimously accepted method on the identifiers of bibliographic metadata, but great advances have been made in recent years. The DOI (digital work identifier) and ORCID (an open and unique alphanumeric ID for researchers and contributors) systems help all the players involved in scientific communications to improve their workflows (Gasparyan, Akazhanov and Voronov, 2014; Mazov and Gureev, 2014).

The use of ORCID, despite its lack of visibility in some areas, is growing quickly and solving many problems of ambiguity and confusion with the names of authors, and enables searches across disciplines, organisations and countries (Haak, Fenner, Paglione *et al*., 2012). A study by Viviana Fernández-Marcial and Llarina González-Solar (2015) on the use of tools to manage the digital identity of researchers of the University of A Coruña through ORCID, ResearcherID, Scopus, Google Scholar, Researchgate and Mendeley, revealed that although the results are not totally negative, the levels should be improved.

The value networks and chains of current science (Kothandaraman and Wilson, 2001; Allee, 2009; Peppard and Rylander, 2006) are activated through algorithms of reputation and impact (traditional and new metrics generated by indicators of citation, visibility and popularity). The connectivity and propagation of digital networks, both general-interest and specialised, contribute to increasing the visibility, knowledge, reputation, number of citations and new metrics such as the "twimpact" (Eysenbach, 2011). What this reticular system of digital intelligence cannot exclude is the need for ethics and transparency to face the risks and uncertainties of the human or algorithmic manipulation by new post-human robotic actors (Gourlay, 2014).

The explosion of digital social networks and tools, which our students use intensively in their interpersonal relationships, is not yet a widespread practice in classrooms nor in student-teacher relations, despite research begins to demonstrate that their use reinforces academic commitment (Topaloglu, Caldibi and Oge, 2016). This research confirms that teachers use networks for interconnection with their peers, to promote their research profile, to meet other authors and to carry out academic search, but use them much less for interaction with students. Students, on the other hand, privilege the use of social networks for educational purposes (Lim and Richardson, 2016).

Another recent and extensive research study of the same type carried out in Italy (Manca and Ranieri, 2016) has revealed that the use of social media is still quite limited and restricted in university education and that academics are not very likely to integrate these devices in their practices for various reasons, such as cultural resistance, pedagogical issues and institutional constraints. There are differences between academics in terms of the forms in which they use and perceive social media, mostly depending on the scientific discipline they belong to. In general, the results emphasise ambivalent attitudes towards the benefits and challenges of social media in the context of education, prevailing obstacles over benefits.

Four skills and attributes are essential for teaching and learning in the 21st century: a) adaptation to the frequent changes and uncertain situations of the current world; b) collaboration and communication in decentralised environments; c) data generation and information management; and

d) liberation from control systems through exploration (Barak, 2016). The immersion of our universities in collective intelligence and clouds of knowledge cannot be only a metaphor but also a reality that cannot be postponed.

This review of scientific literature and studies aims to reinforce the relevance of the observations and questions that were formulated at the beginning of this article and that motivate the survey questions, whose results are presented below.

3. Methods

This survey is part of a wider research project that aims to establish the real penetration, usage, popularity, assessment and impact of general-interest and academic digital social networks in three Galician universities.

The survey was carried out with an online questionnaire that was applied to researchers and teachers of the three Galician universities, using the internal email distribution lists of the TRS of each university. The authors asked for permission to the people responsible at each university. Participants were ensured that their responses and identity would be treated anonymously and respectfully.

The survey was applied to the TRS, composed of permanent and temporary senior lecturers and full professors of the three Galician universities, a total of 5,498 professors and researchers, distributed in the following way: 2.099 from the University of Santiago de Compostela (hence USC), 1,983 from the University of Vigo (hence UVigo); and 1,416 from the University of A Coruña (hence UAC).

The total number of respondents was 463, and were divided in the following way: 173 (37.4%) from the University of Vigo, 165 (35.6%) from the University of Santiago de Compostela, and 125 (27%) from the University of A Coruña. The TRS who responded the survey questionnaire had an average age of 46.58 years and were mostly male (55.3%).

With these results, the margin of error obtained by the randomness of the sample is less than 5%, with an overall accuracy of 4.328%, taking into account the total number of professors and researchers of the three Galician universities and assuming that in the worse situation the probability of response of an item of the survey was 50%, with a confidence interval of 95%.

4. Results
4.1. Use and assessment of Facebook and Twitter

Before presenting and explaining the results, it is necessary to detail the distinction between the various networks of relations and knowledge (Zhang, Wu and Zhao, 2016). The former correspond more to the general-interest category (Facebook and Twitter) and the latter to the academic and scientific type (Researchgate and Academy). General-interest networks are more useful for the communication and marketing relations of institutions, while the scientific ones are focused on offering research resources and measuring reputation. Depending on their orientation and approach we must trace and understand their strategies.

The first approximation to the use of Facebook and Twitter in the University of Santiago de Compostela (USC), the University of A Coruña (UAC) and the University of Vigo (UVigo) shows a

relative endorsement by the whole of the university community (students, faculty, researchers and administrators and service staff), taking into account the fact that these accounts can be followed by people alien to each institution (this would justify the fact that the number of followers of the Twitter account of the UVigo is larger than the number of the university's faculty staff). The only university that shows an estimable percentage of followers on Twitter and Facebook is the UAC, which could also result from the existence, in the case of the USC and the UVigo, of two accounts, one of users (non-official) and another institutional.

Table 1. Galician universities on Facebook and Twitter [1]

	Number of Twitter followers	% of the total community	Number of Facebook Likes	% of the total community
USC	6,083	20.56%	4,290	14.50%
UAC	24,497	95.17%	15,653	60.81%
UVigo	27,666	116.53%	7,325	30.85%

Source: Authors' own creation

On the other hand, the widespread view expressed by the vice-chancellors of faculty and communication of the three Galician universities is that the incorporation of general-interest and academic social networks into teaching and research should be a strategic issue and therefore should be encouraged as an innovative element, regardless of the will of teachers and that all the possibilities offered by the market should be implemented to improve the quality of teaching and research provided they contribute to their improvement.

In terms of the offer made in this regard, in the last three years the three Galician universities offered some courses, through their programmes and units of training and educational innovation (PFID, UFA and FIE, in the case of the USC, UAC, and UVigo, respectively), which show some initial interest in the promotion of the use of general-interests and academic social networks. To be precise, the USC and the UVigo offered two courses on online learning and the educational applications of tools of the social web in the development of personal learning environments (PLE), while the UAC organised a specific course on the use of scientific networks and the management of bibliographic references. This offer was complemented through courses on bibliographic resources regularly offered by the three universities' library services. However, it is also noteworthy that this offer of the Galician universities had a relative reception from the university community, based on the low number of people enrolled in most of the courses.

Table 2. Do you think Facebook and Twitter are suitable for teaching and research?

		Frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Yes	225	48.6	50.2	50.2
	Not	223	48.2	49.8	100.0
	Total	448	96.8	100.0	
Lost	System	15	3.2		
Total		463	100.0		

Source: Authors' own creation

With regards to the specific results of the survey, the first questions asked to professors and researchers were whether they considered appropriate to use general-interest social networks like Facebook and Twitter for teaching and research purposes. The shares of positive and negative responses were quite similar: 50.2% of respondents (225 people) considered the use was appropriate, while 49.8% (223 people) said the opposite.

Of the three Galician universities, the UVigo had a higher percentage of professors and researchers who consider the use of Facebook and Twitter for teaching and research was positive (55.6%). For its part, the UAC had the higher percentage of TRS who were against the use of these social networks (61.3%). The USC is the institution where the percentages of supporters and detractors of the use of these social networks for teaching and research are more similar: 53.2% and 46.8%, respectively.

**Figure 1. Consideration about use of Facebook and Twitter**
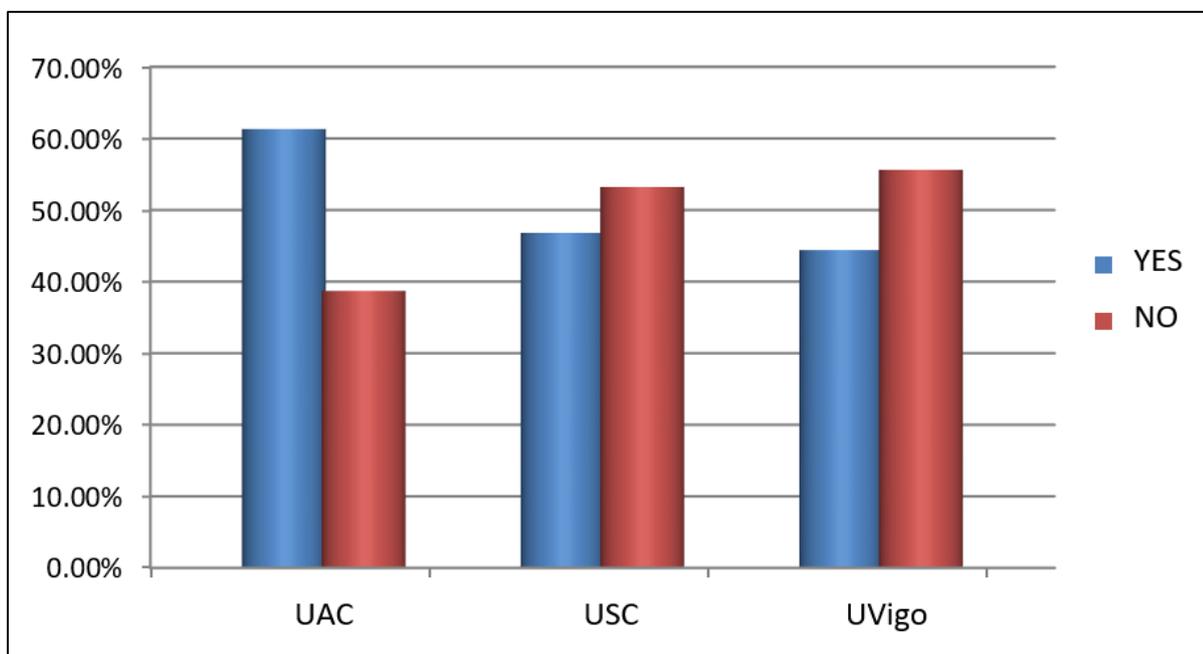
Source: Authors' own creation

By occupational categories, the analysis indicates that, in general, the most occupationally settled groups are more against the use of Facebook and Twitter for teaching and research, with the exception of the group of senior lecturers, in which the proportion of supporters and detractors is almost identical. To be precise, 57.1% of the associated professors, 55.6% of full professors, and 48.9% of the senior lecturers do not consider these social networks are suitable for teaching and research.

By contrast, the largest number of supporters of the use of these tools for teaching and research purposes is in the groups of pre-doctoral researchers (72.5% are in favour and 27.5% are against), associate professors (65.8% in favour and 34.2% against), assistant professors (57.9% in favour and 42.1% against) and postdoctoral researchers (56.3% in favour and 43.8% against), as shown in the following Figure.

Figure 2. Position towards the use of Facebook and Twitter by occupational categories
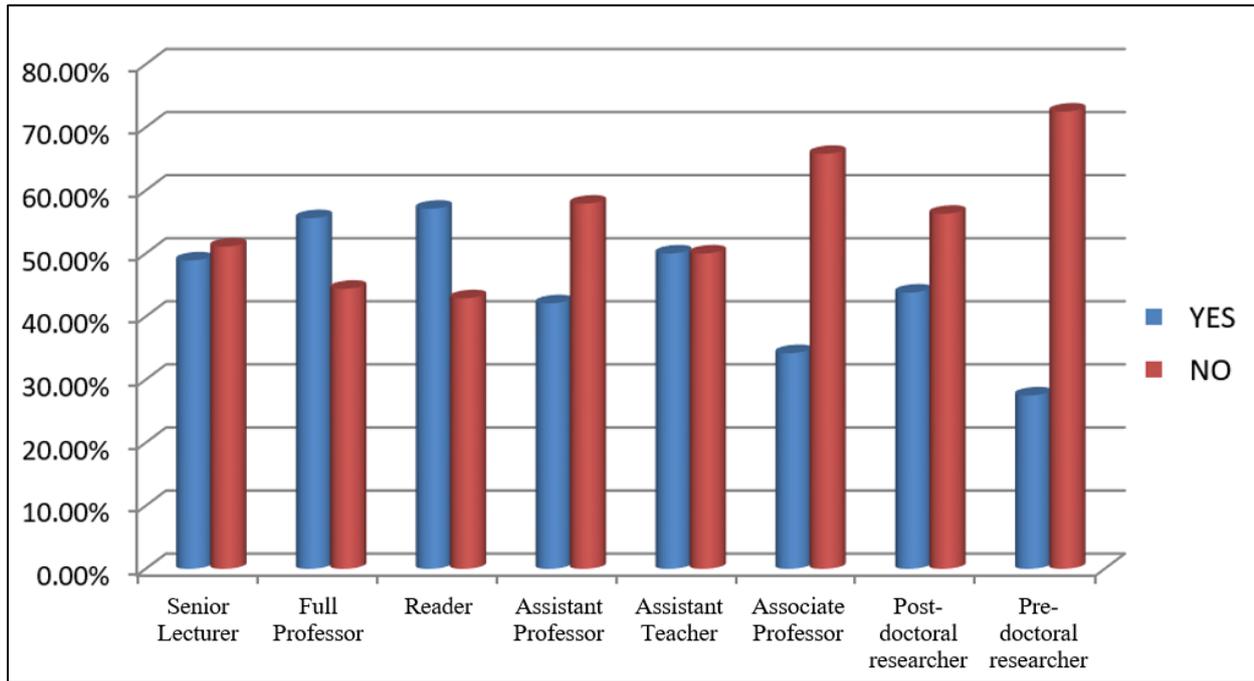
Source: Authors' own creation

4.2. Use and evaluation of search engines

The survey also investigated the knowledge and use of search engines and reference management software by professors and researchers of the three Galician universities.

The results show a high degree of knowledge and use of search engines. To be precise, more than 90% of respondents use them, and of them 48.4% claimed to be basic users while 43.2% claimed to be expert users. Only 6% of respondents claimed to be unaware of them or not use them. Moreover, just one-third (28.73%) of professors and researchers from Galician universities are registered in the ORCID platform.

Google Scholar and Scopus are the two most-known search engines, by over 80% of respondents, while EBSCO and EMBASE are the least known, with similar percentages to those of use, as shown in the following table.

Table 3. Knowledge and use of search engines [2]

Search engine	Knowledge	Use
Scopus	82.29% (n 381)	65.87% (n 305)
Google Scholar	80.56% (n 373)	64.79 (n 300)
PubMed	32.61% (n 151)	23.54% (n 109)

|		
MEDLINE	32.40% (n 150)	19.65% (n 91)
Mendeley	23.54% (n 109)	13.17% (n 61)
EBSCO	19.65% (n 91)	10.58% (n 49)
EMBASE	4.75% (n 22)	2.16% (n 10)
None/no answer	5.83% (n 27)	10.80% (n 50)

Source: Authors' own creation

With regards to the evaluation of the search engines, the professors and researchers of the three Galician universities gave a medium-high rating in all cases, with a median of 3. Scopus was ranked higher than all the other search engines, with a median of 4, while EMBASE was below the average with a median of 2, as shown in the following table and Figure.

Table 4. Evaluation of search engines

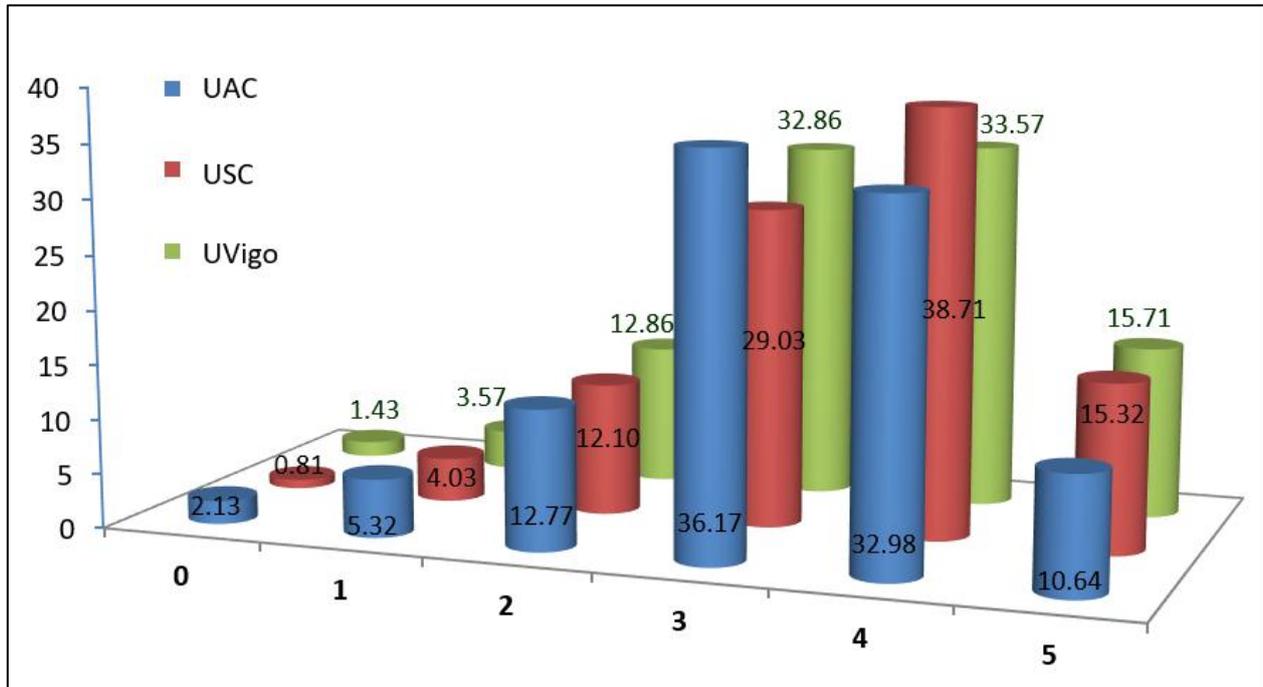|	Average	Median	Standard deviation	Min.	Max.
PubMed	3.17	3.00	1.696	0	5
MEDLINE	3.15	3.00	1.623	0	5
Google Scholar	3.39	3.00	1.093	0	5
Mendeley	2.77	3.00	1.587	0	5
Scopus	3.71	4.00	1.106	0	5
EMBASE	2.00	2.00	1.745	0	5
EBSCO	2.70	3.00	1.687	0	5

Source: Authors' own creation

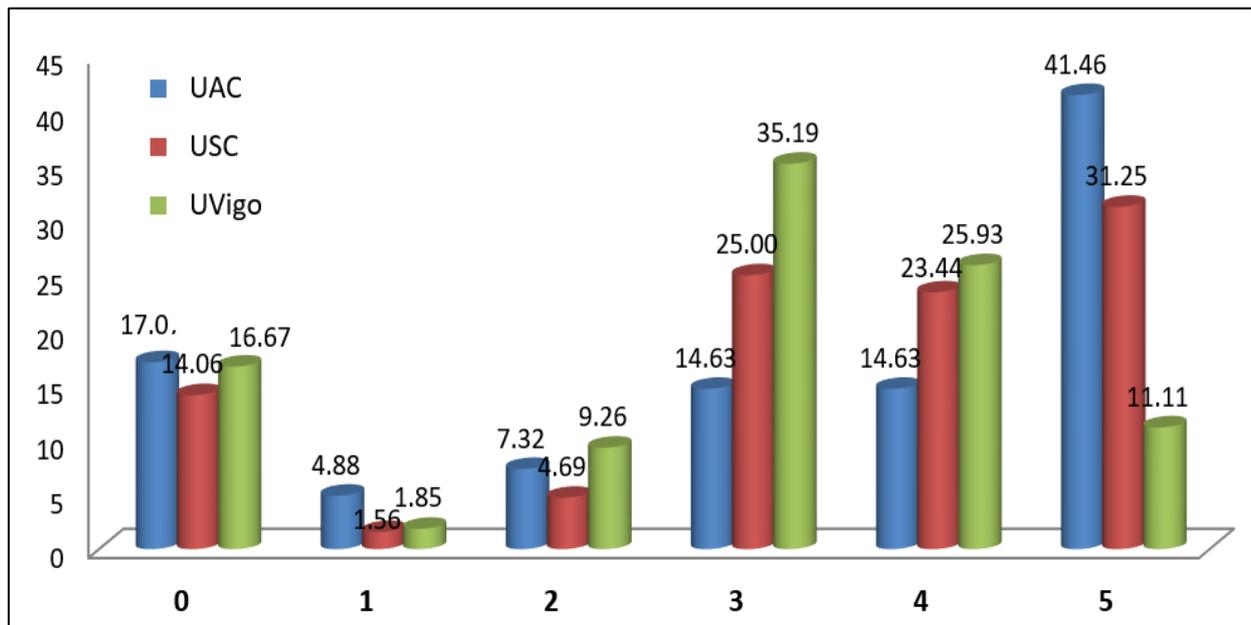**Figure 3. Evaluation of Scopus by university (%)**
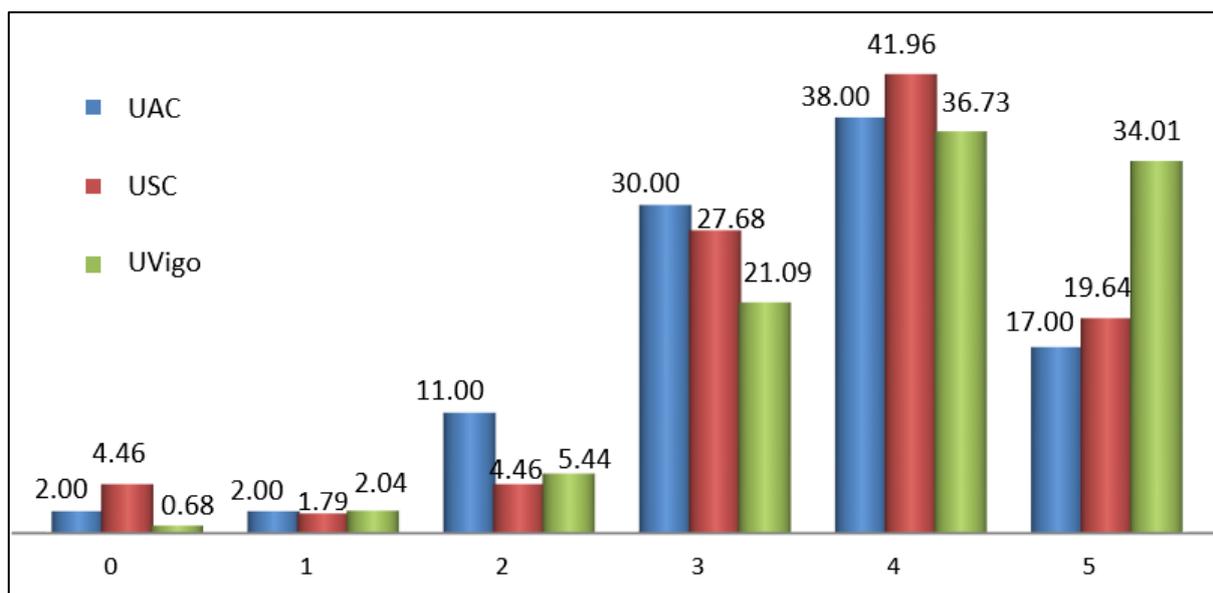
Source: Authors' own creation

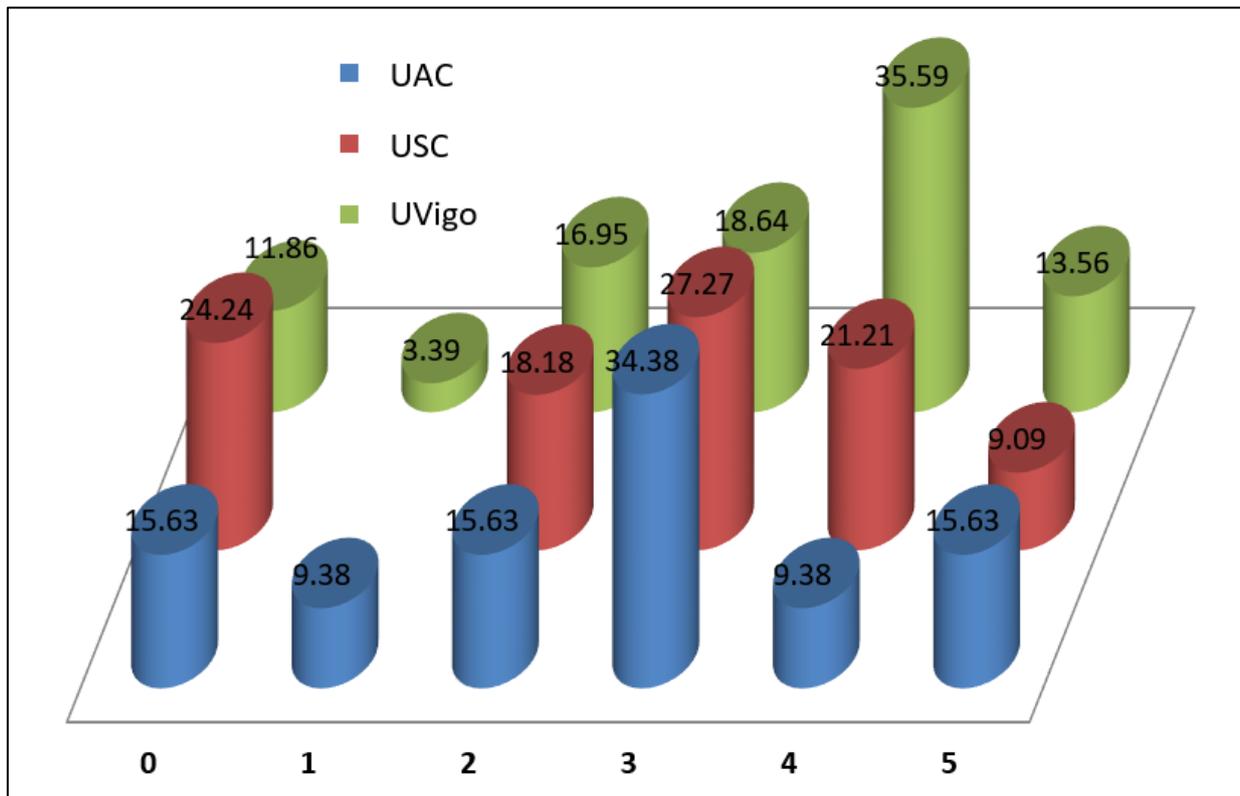**Figure 4. Evaluation of Google Scholar by university (%)**

Source: Authors' own creation

Figure 5. Evaluation of PubMed by university (%)

Source: Authors' own creation

Figure 6. Evaluation of Mendeley by university (%)

Source: Authors' own creation

Finally, when the TRS of the three Galician universities were asked what Google products they used for teaching and/or scientific activities, the results were as follows:

Table 5. Google products used by the TRS

Google product	N	%
Scholar	290	62.63%
Drive	201	43.41%
Calendar	179	38.66%
Google+	130	28.08%
Groups	40	8.64%
Blogger	27	5.83%
AdWords	9	1.94%
Code	5	1.08%
No response	69	14.90%

Source: Authors' own creation

5. Discussion and conclusions

The results of this survey indicate that there is a fairly high and significant proportion of the TRS that knows and uses search engines in the three Galician universities, but also that the opinions of the TRS are quite divided in equal proportions, with regards to the suitability of general-interest social networks like Facebook and Twitter for teaching and research purposes: 50.2% support their use and 49.8% do not. The evaluation of the usefulness of social networks is more positive among the TRS without permanent academic contracts and with less dedication to university work.

In the case of search engines, the proportion of TRS who have basic knowledge of them (48.4%) is quite similar to the proportion that claims to be expert users (43.2%). Scopus stands out as it is known and used by 82.92% and 65,87%, respectively of the TRS of Galician universities. In second place is Google Scholar, known and used by 80,56% and 64,79%, respectively of the TRS. There is a relative knowledge and assessment of the reference management software Mendeley, with slight variations depending on each university. With regards to the Google products most commonly used for teaching and research, they are Google Scholar, Drive and Calendar.

The results of this work contrast, to some extent, with the ones obtained by a survey carried out by the journal Nature **[3]** among researchers from different countries on the social and academic networks they knew and used regularly. The results were as follows, in descending order: 1. Google Scholar, 2. ResearchGate, 3. LinkedIn, 4. Facebook 5. Google+, 6. Twitter, 7. ResearcherID, 8. Mendeley (with 48% of knowledge and 8% of regular visitors), and 9. ORCID.

As we can see, and despite this study was carried out a year before, percentages of awareness and use of Mendeley were higher than among the TRS of Galician universities. Moreover, the percentages of awareness and use are much lower with regards to the ORCID platform, which is used by just one-third (28.73%) of the TRS of Galician universities.
These data undoubtedly serve to contrast tendencies, also with regards to the use of general-interest social networks, which researchers use and recognise as academic tools in combination with the other networks: Facebook occupies the fourth position and Twitter the sixth. The latter network is regularly used only by 13% of respondents but is more interactive, because 40% of the researchers that use Twitter consider it to be a good tool to comment on the research works that they considered relevant to their fields.

On the other hand, the survey conducted in the three Galician universities also gave respondents the possibility to leave a comment, suggestion or criticism.

In this sense, it is important to highlight the opinions of those who took advantage of this section to narrate a case or reiterate their scepticism about the possibility of the use of social networks such as Facebook and Twitter to contribute in any way to improve university teaching and research, or rather trivialise it through, for example, the generation of chats that trivialise the themes. Some researchers even highlighted the need to differentiate between Facebook and Twitter, to understand that the first is almost exclusively for leisure purposes while the second admits different profiles, which may be academic or professional.

In any case, we offer these considerations, findings and conclusions to be compared with future research works.

6. Notes

1. Data obtained on 21 June, 2016, from the official accounts of each of the three universities. The USC and the UVigo have other two non-official Facebook pages. In the case of the USC the non-official account has even more *likes* than the official one, 14,259 vs. 4,290, respectively. In the case of the UVigo, the figures are more balanced and the official account dominates in terms of likes over the unofficial account: 7,325 vs. 5,500, respectively. The non-official accounts were created by users without any kind of institutional affiliation or support.

2. PubMed and Medline are mostly biomedical databases while EMBASE focuses on the field of medicine and pharmacology. Mendeley is a scientific social network that also works as a reference manager software for the management of academic citations.

3. The online survey, conducted in August 2014, received over 3,500 responses from researchers from 95 countries. Cf. Van Noorden, R. (2014): "Scientists and the Social Network", *Nature*, vol. 512, 14, pp. 126-129. The complete results of this survey are available at: http://www.nature.com/news/online-collaboration-scientists-and-the-social-network-1.15711 (consultation date: 28 March, 2016).

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