The educational use of Social Networks Sites: a comparative analysis between the Spanish and English production

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Abstract

Considering the increasing importance and presence of the Social Networks Sites (SNSs) in educational scenarios, this work is aimed at exploring the scientific literature on their educational use for the last years. Through a bibliometric analysis composed of 191 journal articles written in English and Spanish, found in 7 different databases (ERIC, Scopus, DOAJ, EBSCO, ISOC, REDIB, and PsycARTICLES), the following variables were analysed: database, academic journal, authorship (including number of authors, country, and institution), year of publication, Social Network Site involved, level of education, study population, and nature of the study. Results show the existence of a greater number of publications written in Spanish than in English as well as a higher interest in the topic from Spanish authors, academic journals, and institutions. Facebook and Twitter were ranked as the most popular SNSs in both English and Spanish articles. At the same time, the majority of the selected articles were focused on tertiary education and their students. Finally, Scopus was the one which hosted the largest amount of international literature (most of it framed by a qualitative research design). All in all, the scientific production analysed on the educational use of SNSs reveals a considerable, increasing, and developing interest in the present topic. Thus, several educational implications emerge with the introduction of digital scenarios, such as SNSs, in the educational environments.

Keywords

Social Networks Sites, Social Media, Education, Learning, Bibliometric Analysis.

I.Introduction

The emergence of social media constitutes a recent phenomenon that has transformed communication and socialization processes. Consequently, new ways to interact that transcend physical spaces have surfaced. This circumstance cannot be disregarded by education. In the last two decades, many studies have shown how Social Network Sites (henceforth, SNSs) have gradually been introduced into the educational scenarios (Nagel, Remillard, Aucoin & Takenishi, 2018; Tuzel & Hobbs, 2017; Norman, Nordin, Din, Ally & Dogan, 2015; Gómez, Andersson, Park, Maw, Crook & Orsmond, 2013; Del Moral & Villalustre, 2012; Pasadas Ureña, 2010; Hiradhar & Gray, 2008). Thus, offering numerous educational possibilities for emerging generations to explore diverse human dimensions in formal, non-formal, and informal educational contexts. At the same time, there are emerging SNSs as tools for teachers to implement different active methodologies that go beyond the traditional ones (Gómez, Ferrer & De la Herrán, 2015; Castaño-Garrido, Maiz & Garay, 2015; González & Ruiz, 2013). Therefore, SNSs have substantial educational implications and relevance for research, even more when considering this is a new but rising field insufficiently explored.

In the light of this context, it is worth wondering how it has been the presence of SNSs in education since its appearance and, specially, the pedagogical use they are assuming in the educational times and spaces. Nevertheless, it is unlikely to find academic works that analyse the amount of publications produced about the educational use of SNSs in the last years. The work of Delgado, Torres, Jiménez & Ruiz-Pérez (2006) tried to study the methodological possibilities of social media through the scientific production in order to detect the existence of scientific institutions and academic networks. Following this approach, Repiso, Torres & Delgado (2011) examined the scientific production on social media in the Spanish doctoral theses about television. However, social networks were considered under its analogical meaning in both publications intending to identify academic groups and organisation patterns into the Spanish universities. Then Ramos, Del Pino & Castelló (2014) published a study focused on the scientific publications in several Spanish communication journals about Web 2.0 and social networks. Even though they aimed for analysing the principal working lines in the field of researching SNSs, there is a lack of works aimed at studying the scientific production on the educational use of SNSs.

This paper offers a bibliometric analysis on SNSs in Education, in order to explore the scientific production around the educational use of these 21st century tools. More precisely, in order to achieve that goal what is pursued is to: a) Establish which databases, academic journals, authors, and institutions are likely to publish on the topic; b) Analyse the evolution of the amount of publications around SNSs in Education over the years: c) Determine in which level of education and population journal articles are mainly focused on; d) Find which Social Network Sites are more popular among scientific production; and e) Analyse the implicit methodology (drawn by the research design) of the different types of studies.

All in all, studies focused on understanding the manner in which literature on SNSs has evolved in academic terms from a global perspective are needed. Therefore, the educational use of SNSs has the significance and relevance for research to explore its current situation as well as the interest that the present topic has had along years.

II. Method

a. Procedure and sample

The purpose of the present study is to analyse the most relevant and recent production concerning the fields of SNSs and Education. For that purpose, units of analysis were defined in the first step. Once we selected the keywords and their possible variations, they were introduced in the 'search tab' of the selected databases (ERIC, Scopus, DOAJ, EBSCO, ISOC, REDIB, and PsycARTICLES). The search strategy was the following: we inserted *Social Media or *SNSs AND/OR *Education, or *Teaching, or *Learning, as the main descriptors (*Redes sociales AND/OR *Educación or *Enseñanza or *Aprendizaje -in Spanish-). Then we only considered the categories of "Journal articles" and "Full-text". According to the aim of the paper and with the purpose of considering as much literature as could be possible, researchers decided not to determinate an interval of years. And finally, after an extensive search, the authors found academic literature from 2006 to 2018.

As a result of the abovementioned search, a total of 672 academic works about SNSs and Education were gathered. After this profound search, inclusive and exclusive criteria were applied. Inclusion criteria were related to those articles whose content aimed at exploring the use of SNSs within formal, non-formal, and informal educational contexts. In addition, the articles must be written in Spanish or English. Selection criteria were limited to consider peer-reviewed academic journal articles with an open access policy. As mentioned, none criterion related to the date of publication was considered. By combining inclusive and exclusive criteria, a total of 191 articles published were selected for the bibliometric analysis (which supposes the 28.42% of the total of articles found). The result of the classification was a sum of 102 articles in English and 89 in Spanish.

Having selected all the works constituting the sample, they were read as to determine the data required for the subsequent analysis. The content related to the selected variables was imported into two Microsoft Excel documents. Lastly, all the data collected was introduced in the software IBM SPSS Statistics 22 for the further analysis in order to calculate the descriptive statistics needed.

b. Materials

With the aim to achieve the purposes of the study, an assortment of seven relevant national and international databases in the field of Education has constituted the central tools of the present work. As we tried to cover academic production from a global approach, a considerable number of databases in which prevailed articles written in English and Spanish were selected. Quality of the publications was based on the Index Impact as a determinant factor for the selection. As a consequence of both language and relevance criteria, the selected databases were the followings. Firstly, *ERIC* (Education Resources Information Center), sponsored by the Institute of Education Sciences of the U.S. Department of Education. *ERIC* is an authoritative database which indexes a variety of full-text education literature and resources, such as journal articles, books and chapters, conferences, policy papers, etc., building a collection of more than 300.000 documents. All the papers are included in the *Current Index of Journals in Education* (CIJE) and *Resources in Education Index*, constituting this database an influential and impact resource for educational research. Secondly, *Scopus* was selected due to its large abstract and citation collection of peer-reviewed literature in the fields of Social Sciences, offering a compilation of impact and open-access journals, book series, conferences proceedings, or trade publications. Thirdly, *PsycARTICLES* is the American Psychology Association (APA) database, which provides easily access to the full text of more than 80 reference journals in behavioural science and related fields including education. *PsycARTICLES* journals are published by authorities such as APA´s Educational Publishing Foundation, the Canadian Psychological Association, or Hogrefe Publishing Group. Then,

DOAJ (Directory of Open Access Journals) is an online directory that indexes and provides access to a total of 67226 high quality, open-access, peer-reviewed educational sources. With more than 1,110,870, *REDIB* or in other words "Red Iberoamericana de Innovación y Conocimiento Científico" (in English Ibero-American Network of Innovation and Scientific Knowledge) is a database of scientific and academic content in electronic format produced in the Ibero-American sphere. Considering the Spanish databases, *ISOC*, dependant on the Consejo Superior de Investigaciones Científicas (CSIC), compiles and disseminates the scientific production in the field of Social and Humanity Sciences in the Spanish language. It includes a largely specific section for indexed educational literature. Lastly, *EBSCO* has a huge number of full-text and open-access journals as well as popular thematic index, providing accessibility and content possibilities that makes it an interesting database for the analysis of Spanish publications.

c. Statistical Analysis and variables

The present work constitutes a descriptive bibliometric analysis on the scientific production which has published so far among SNSs and Education. A descriptive analysis focussed on a frequencies and percentages was used to study the following variables:

1. *Database*: considering the digital platform where sources were found[1].
2. *Academic journal* where the paper was published. This variable includes the Index Impact of the most popular journals as well as their most quoted papers.
3. *Authorship*: including the number of authors and co-authors, the name of the academical institution, and the corresponding country.
4. *Year of publication of the paper.*
5. *Level of education*: A common framework drawn by the International Standard Classification of Education (ISCED) was used to delimit this variable. Nevertheless, ISCED levels have been clustered in the following categories:
    - Primary education: *ISCED level 1* - Primary education.
    - Secondary education: *ISCED level 2* – Lower secondary education, *level 3* – Upper secondary education, and *level 4* – Post-secondary non-tertiary Education.
    - Tertiary education: *ISCED level 5* – Short-cycle tertiary education, *level 6* – Bachelor's or equivalent level, *level 7* – Master's or equivalent level, and *level 8* – Doctoral or equivalent level.
6. *Population*: considering similar criteria to the previous variable, this variable was gathered in Primary, Secondary and Tertiary students.
7. *Social Network(s) Site(s) involved in the study.*
8. *Nature of the study*: meaning whether the design of the study was framed by a quantitative, qualitative, theoretical, or mixed methodology[2].

[1] Even though databases are part of the methodology, it was pertinent to consider them as an independent variable in order to analyse their scientific production regarding the topic.
[2] This classification was made by following epistemological and theoretical frameworks.

III. Results

a. Database

With regard to the selection of the reviewed databases in the study, results show that *ERIC* is the most popular database for the journal articles written in English (50.6%), whereas *REDIB* is the one for those papers written in Spanish (45.1%) (see Table 1: *Scientific Production*). Considering the sum of the articles, *Scopus* occupies the first position in the ranking (27.2%) and the second for both English and Spanish works (16.19% and 36.3%, respectively). Furthermore, it is remarkable that the Scopus' production in Spanish is considerably higher than in English, even though it has the same position in both rankings. These results could show a greater interest in the study of SNSs from the Spanish production than in the English one. However, it has to be considered that the number of articles written is Spanish is slightly higher than those in English since out of seven databases, two are Spanish database and one is Iberoamerican.

The difference among comparative and overall percentages of *Scopus*, *ERIC,* and *REDIB*, is notably short. Thus, the databases mentioned are the ones in which the number of publications on SNSs and Education is the highest, reaching approximately a 77% of the total of the international scientific production on the topic.

On the contrary, *ISOC* and *PsycARTICLES* are the less popular databases of the classification. What is more, *PsycARTICLES* only appeared as an option for those articles written in English (2.2%). By contrast, *ISOC* has similar percentages and positions for both English and Spanish papers in the individual ranking (4.5% and 6.9%, respectively) but the same percentage than *EBSCO* in the total of articles (5.76%). Following this approach, *EBSCO* does not seem to be interested in the educational use of SNSs in both English and Spanish contexts.

Considering these results, the amount of scientific production on SNSs and Education is similarly distributed in those databases that published mostly in English than those that do it in Spanish.

English			Spanish			Total		
Database	*f*ı	*f*ı %	Database	*f*ı	*f*ı %	Database	*f*ı	*f*ı %
ERIC	45	50.60	REDIB	46	45.10	Scopus	52	27.20
Scopus	15	16.90	Scopus	37	36.30	ERIC	45	25.60
DOAJ	12	13.50	DOAJ	12	11.80	REDIB	46	24.10
EBSCO	11	12.40	ISOC	7	6.90	DOAJ	24	12.60
ISOC	4	4.50				EBSCO	11	5.76
PsycARTICLES	2	2.20				ISOC	11	5.76
						PsycARTICLES	2	1.05
N	89	100%	N	102	100%	N	191	100%

Table 1: *Scientific Production*

b. Academic journal

First of all, it has to be considered that we decided to cluster a number of scientific journals whose frequency was $f_i=1$, as a single article was identified and located in their directory. This cluster has been called "others" for both classifications and represents the 51.68% of the total of articles written in English and the 35.29% of those written in Spanish. Even though the list of Spanish articles is larger than the English one, this category achieves a higher number of publications written in English than in Spanish. Moreover, there are a greater number of journals with $f_i=2$ in the Spanish classification, which could show a bigger interest of Spanish publications in the topic.

With regard to those academic journals with a higher number of publications on SNSs and Education, *Comunicar. Revista de Medios de Comunicación y Educación* leads the first position of the ranking for both English ($f_i=5$) and Spanish ($f_i=8$) scientific literature (see Table 2: *Scientific Production according to the Journal*). This last frequency is followed by various Spanish journals: *Revista Complutense de Educación* ($f_i=7$), *Estudios Sobre el Mensaje Periodístico* ($f_i=6$), and *Profesorado. Revista de Currículum y Formación del Profesorado* ($f_i=5$). These results could lead again to a greater interest of Spanish reviews in the topic than the English ones, especially when they exceed the scientific production collected in the most popular journal of the English classification (*Comunicar. Revista de Medios de Comunicación y Educación* - $f_i=5$). In addition, the *British Journal of Educational Technology*, the *Educational Sciences: Theory & Practice*, the *IAFOR Journal of Education*, and the *Journal of Education and Practice* they all gather the same number of articles written in English. They are also the followings in the ranking below the Spanish journal.

It is remarkable that the first journal of both rankings is the unique Spanish academic review in the English one. On the contrary, there are two international journals in the Spanish classification: *Innoeduca. International Journal of Technology and Educational Innovation* and *RUSC. Universities and Knowledge Society Journal*. This fact might mean that international reviews are more valued by Spanish academics than English are for Spanish reviews. Additionally, one of the most popular journals in the Spanish classification, *Estudios Sobre el Mensaje Periodístico*, is apparently not related to the field of Education.

English		Spanish	
Journal	f_i	Journal	f_i
Comunicar. Revista de Medios de Comunicación y Educación	5	Comunicar. Revista de Medios de Comunicación y Educación	8
British Journal of Educational Technology	4	Revista Complutense de Educación	7
Educational Sciences: Theory & Practice	4	Estudios Sobre el Mensaje Periodístico	6
IAFOR Journal of Education	4	Profesorado. Revista de Currículum y Formación del Profesorado	5
Journal of Education and Practice	4	Apertura. Revista de Innovación Educativa	4
International Review of Research in Open and Distance Learning	2	Historia y Comunicación Social	4
English Language Teaching	2	Opción	3

International Journal of Educational Technology in Higher Education	2	RED. Revista de Educación a Distancia	3
International Journal of Teaching and Learning in Higher Education	2	EDMETIC. Revista de Educación Mediática y TIC	2
International Journal of Emerging Technologies in Learning	2	Education in the Knowledge Society	2
International Review of Research in Open and Distributed Learning	2	Eduweb, Revista de Tecnología de Información y Comunicación en Educación	2
JALT CALL Journal	2	Etic@net. Revista científica electrónica de Educación y Comunicación en la Sociedad del Conocimiento	2
Journal of Education and Learning	2	Innoeduca. International journal of Technology and Educational Innovation	2
Journal of Educational Technology	2	Prisma Social	2
Journal of Technology and Science Education	2	QUID: Investigación, Ciencia y Tecnología	2
Malaysian Online Journal of Educational Technology	2	RELATEC - Revista Latinoamericana de Tecnología Educativa	2
Turkish Online Journal of Educational Technology TOJET	2	Revista de Estudios e Investigación en Psicología y Educación	2
- Others	46	RUSC Universities and Knowledge Society Journal	2
		Teoría de la Educación	2
		Vivat Academia. Revista de comunicación	2
		Digital Education Review	2
		Others	35
N	89	N	102

Table 2: *Scientific Production according to the Journal*

Once the journals were listed based on their frequency, the top five journals were selected and searched their h5-index, as well as the number of citations of their most cited paper (see Table 3: *H5-index and the most cited paper in the top five English journals* and Table 4: *H5-index and the most cited paper in the top five Spanish journals*).

ENGLISH			
Journal	h5i	Paper	C[3]
Comunicar: Media Education Research Journal	38	Teacher-Student Relationship and Facebook-Mediated Communication: Student Perceptions	7
British Journal of Educational Technology	57	Tweeting for learning: A critical analysis of research on microblogging in education published in 2008-2011	241
Educational Sciences: Theory & Practice	30	Determining Open Education Related Social Media Usage Trends in Turkey Using a Holistic Social Network Analysis	3
IAFOR Journal of Education	16	Social Media Use in Algerian Universities: University of Constantine 2 Case Study	7
Journal of Education and Practice	17	Extending Student Discussions beyond Lecture Room Walls via Facebook	7

Table 3*: H5-index and the most cited paper in the top five English journals*

In relation to the h5-index, through which it can be observed how many papers published from 2014 to 2018 (the last 5 complete years) had at least h citations each one, it was detected that the journal that had a higher h5-index was an English one (*British Journal of Educational Technology*), with a 57 h5-index. The second position was occupied by *Comunicar*, a journal that publishes in both languages, with a 38 h5-index. Finally, the third position, with a 30 h5-index, was occupied by *Educational Sciences: Theory & Practice*, an English one.

SPANISH			
Journal	h5i	Paper	C
Comunicar. Revista de Medios de Comunicación y Educación	38	El uso académico de las redes sociales en universitarios	283
Revista Complutense de Educación	16	Uso problemático de las redes sociales en estudiantes universitarios	25
Estudios Sobre el Mensaje Periodístico	14	Análisis del valor comunicativo de las redes sociales en el ámbito universitario: estudio de los usos de Twitter en el aula	9
Profesorado. Revista de Currículum y Formación	21	Aprender a usar Twitter y usar Twitter para aprender	10
Apertura. Revista de Innovación Educativa	10	Uso de las redes sociales como estrategias de aprendizaje. ¿Transformación educativa?	46
Historia y Comunicación Social	15	Uso de redes sociales como elemento de interacción y construcción de contenidos en el aula: cultura participativa a través de Facebook	16
		Uso académico de redes sociales: Análisis comparativo entre Estudiantes de Ciencias y de Letras	

Table 4: H5-index and the most cited paper in the top five Spanish journals

[3] "C" refers to the number of citations of the paper.

Regarding the citations of the most cited paper(s) of each journal, it is detected that the two first journals with the highest h5-index were also the ones that had the most cited papers. This relation is very logical as, as it can be noticed when calculating the h5-index, this index is based on the number of publications and on the total number of citations.

c. Authorship

Authorship data are interesting to detect some trends concerned to possible author(s) of reference, institutions (especially universities) where the research on SNSs and education is pioneer, as well as the countries which might have more interest in the educational use of SNSs.

Regarding the number of authors, the average per article in the total production was 2.25 and the midpoint of the data set (median) was 2. Of the total of 191 articles, 49 (25.65%) were written by a single author, 80 (41.88%) by two authors, 41 (21.4%) by three authors, 13 (6.8%) by four authors, 3 (1.57%) by five authors and, finally, 5 (2.61%) by six authors. Concerning the affiliation of the authors, although most of the papers were written by more than one author (74.35%), the majority of these co-authored papers were written by academicians that belong to the same research institution and/or country.

Then, the scientific production is analysed according to the country of origin (see Table 5: *Scientific Production and Country)*. In relation to the English production, half of the analysed articles found (50.54%) come from the union of five countries: Spain (13.98%), United States of America (11.83%), Turkey (10.75%), United Kingdom (8.60%), and China (5.38%). In concordance with these results, the universities that are positioned among the top four in publishing, all of them with a percentage of 2.25%, are the *Technical University of Madrid* (Spain), the *University of Seville* (Spain), the *Anadolu University* (Turkey), and the *Dicle University* (Turkey). These data call the attention to the origin of the universities that lead the English ranking, especially considering that their official language in both countries is not English.

Referring to the Spanish articles, Spain is the country that seems to be more interested in the topic (73.87%), followed by Mexico (8.11%), and Colombia (6.31%). With respect to the institutions, the ones that publish the most are: in the first place, the *University of Granada* and the *University of Seville* (with 5.26% both of them); in the second, the *Complutense University of Madrid* and the *University of Malaga* (3.76%); and, in the third, the *International University of La Rioja*, the *National University of Distance Education*, the *University of Guadalajara*, the *University of Oviedo*, and the *Autonomous University of Barcelona* (3.01%). These results confirm the trend previously detected in which Spanish contexts are more involved in publishing academic works about the use of SNSs in education.

English			Spanish		
Country	f_i	%	Country	f_i	%
Spain	13	13.98	Spain	82	73.87
United States of America	11	11.83	Mexico	9	8.11
Turkey	10	10.75	Colombia	7	6.31
United Kingdom	8	8.60	Argentina	2	1.80
China	5	5.38	Portugal	2	1.80
Canada	4	4.30	Venezuela	2	1.80
Australia	3	3.23	Others	7	6.3
Malaysia	3	3.23			
Nigeria	3	3.23			

Saudi Arabia	2	2.15			
Jordan	2	2.15			
New Zealand	2	2.15			
Thailand	2	2.15			
Israel	2	2.15			
Others	23	24.73			
N	93	100%	N	111	100%[4]

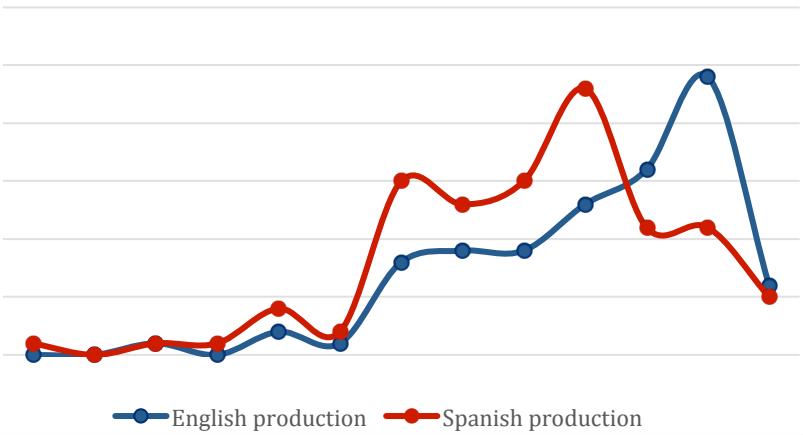
Table 5: *Scientific Production and Country*

d. Evolution of scientific production

It has been said that the presence of academic literature on the educational use of SNSs constitutes a recent phenomenon. Supporting this approach, results show that the first publications on the topic were found in 2006 in the Spanish context, whereas 2008 was the year when the first English production was registered. The number of academical works continued being very low and not always progressive up to 2012, when it was registered the 12% of the total production. Inside this percentage, the amount of Spanish production remained higher than the English one (f_i=15 > f_i=9), which is coherent with the higher interest in the introduction of SNSs in education among the Spanish academic literature. At the same time, it can be said that a "journal boom" might have occurred from 2011 to 2017 among production on SNSs, being 2015 the year in which more Spanish papers were published and 2017 the most popular year for English ones. This event could have contributed to the increasing tendency of publishing literature on the topic.

When observing the data referred to the total production, it is possible to detect that the number of papers is increasing progressively despite of the decrease in 2016 and data related to 2018 so far (see Graph 1: *Evolution of English and Spanish production)*. However, results are more variable when comparing Spanish and English production. While the first one is showing a greater interest on SNSs and education than the second from the beginning, it has reduced its number of publications in the last three years. This qualitative change draws the attention when we focus on data related to English production that was raised in the same period. What is more, the highest frequency registered in both English and Spanish production corresponds to 2017 data in English (f_i=24).

Graph 1: *Evolution of English and Spanish production*



[4] Nine papers (4.71%) were written by authors from more than one country. Therefore, in order to analyse the countries of precedence, each country was pointed individually. For example, if one article was written by three authors, one from France, a second one from Spain, and another from Israel, this single article pointed to France, Spain, and Israel.

In general terms, the academic production on SNSs and education has resulted in an increasing presence in the field of educational research along years, finding a greater interest in the Spanish contexts.

e. Social Network Sites involved

The interest for using the Social Network Site *Facebook* as an educational tool is widely notable for both English and Spanish academic literature (approximately the 25% of the individual and total production). Secondly, there is a big amount of journal articles, called "Generic", in which any SNS was specified. This cluster represents nearly from a 15 to 22% of the total, achieving a higher percentage by the Spanish production than the English one. Thirdly, *Twitter* is the next and most popular SNS of the individual (14.47% in English; 10.81% in Spanish) and the total production ranking (12.70%) (see Table 6: Social Network Sites involved). On the contrary, some of the less popular SNSs were clustered by the category "Others", following the same criteria than in Academic journal, its low representativeness frequency (f_i=1). Generic category, which occupies the second position in all the rankings (19% of the total production approximately), is referred to those articles related to social media or SNSs in a generic way with any specified SNSs.

The popularity concerning other SNSs varies between the Spanish and English classification, although *WhatsApp*, YouTube, *Web 2.0*, or *LinkedIn* are fairly popular in both scientific productions. With regard to data relative to the total production, it is remarkable the notable presence of social media in eLearning platforms, which shows a certain interest in using these environments for the teaching and learning process.

English			Spanish			Total		
SNSs	f_i	f_i %	SNSs	f_i	f_i %	SNSs	f_i	f_i %
Facebook	39	24.53	Facebook	37	25.00	Facebook	76	24.76
Generic	24	15.09	Generic	33	22.3	Generic	57	18.57
Twitter	23	14.47	Twitter	16	10.81	Twitter	39	12.7
YouTube	13	8.18	eLearning	12	8.11	Web 2.0	18	5.86
WhatsApp	10	6.29	Web 2.0	10	6.76	YouTube	17	5.54
Web 2.0	8	5.03	Tuenti	9	6.08	eLearning	15	4.89
Google+	6	3.77	YouTube	4	2.70	WhatsApp	12	3.91
Myspace	5	3.14	LinkedIn	4	2.70	Tuenti	9	2.93
LinkedIn	4	2.52	Edmodo	3	2.03	Google+	8	2.61
Pinterest	3	1.89	Instagram	3	2.03	LinkedIn	8	2.61
eLearning	3	1.89	WhatsApp	2	1.35	Instagram	6	1.95
Blog	3	1.89	Google+	2	1.35	EDMODO	6	1.95
Edmodo	3	1.89	PatataBrava	2	1.35	Myspace	5	1.63
Instagram	3	1.89	Others	11	7.43	Pinterest	3	0.98
Others	12	7.55				Others*[5]	28	9.12
Total*[6]	159	100%	Total	148	100%	Total	307	100%

Table 6: *Social Network Sites involved*

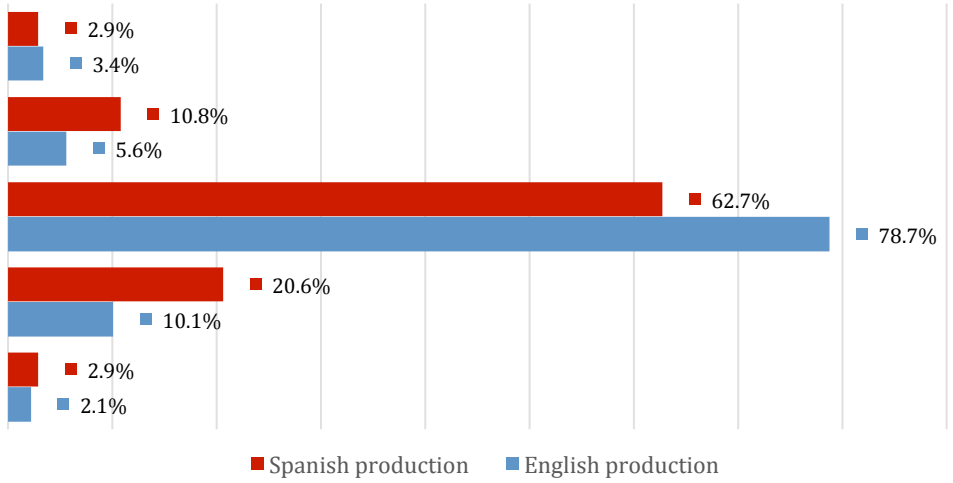
[5] Data concerning *others (total)* does not correspond to the sum of *others (English)* plus *others (Spanish)* because the lack of coincidence of SNSs in the total classification.

[6] Total of English and Spanish production concerning SNSs involved category differ to the total of articles due to various SNSs were found in the same academic work. It refers to the total of SNSs gathered in all the selected papers.

f. Level of education and population

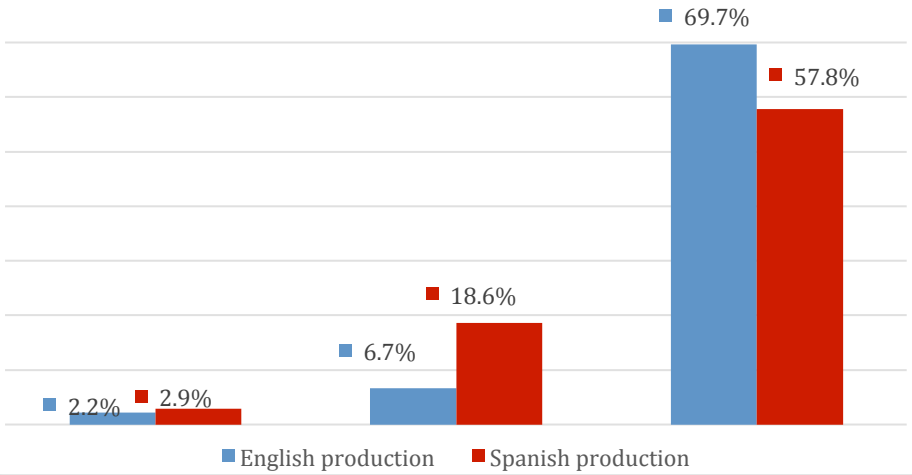
Considering the results, the most predominant level of education in scientific literature on the use of SNSs in education is largely represented by Tertiary Education in both English and Spanish production (70.2% in the total production). This level is followed by data of Secondary Education, which represents a 15.2% of the total production and, finally, by data of Primary Education (2.62%). These results are coherent with data related to "population", as Tertiary education students are the most chosen group for educational intervention (63.4%), followed by Secondary and Primary students (with a 14.1% and 2.6% of the total production, respectively). These results are suitable for both English and Spanish production (see Graph 2*: Level of education of English and Spanish production and Graph 3: Study population of English and Spanish production*).

Graph 2: *Level of education of English and Spanish production*



It has also been found a notable amount of journal articles in which any educational level or population was specified, by considering Social Networks Sites or social media under a generic framework ("Undetermined articles", with a 8.4% of the total production; "Undetermined population", with a 11.5% of the total production). In this light, it is possible to highlight a couple of interesting findings. Regarding the level of education, undetermined Spanish production has approximately the double of presence than it has in the English production. This difference could be product of the different traditions of educational research. On the contrary, undetermined journal articles corresponding population has even a higher presence in the English literature than those that are focused on secondary students (9% > 6.7%). This second finding might be opposed by the first one, so it might be interesting to analyse them in greater depth in a content analysis.

Graph 3: *Study population of English and Spanish production*



Finally, in a similar way than the "generic" group in SNSs popularity, it is possible to find a great number of journal articles in which any none of level of education or population was defined. The category "Others" refers to those educational levels and population that exceed the limits of formal education (non-formal and informal education) and represents the 3.1% of the total production concerning educational levels, and the 9.4% of the total production concerning population. It is interesting that percentages related to this category are higher than those related to Primary education or students in both analysis, which confirm the low interest that English and Spanish research seem to have in this level of education and, therefore, its population. Other categories in population achieve the second highest percentage after Tertiary education students (12.40%). This result shows that the English production is more interested in other kind of population than primary or secondary ones.

g. Nature of the study

The last variable of the analysis corresponds to whether the design of the study was drawn by a quantitative, qualitative, theoretical, or mixed method. As it is possible to see in the following table (*Table 6: Nature of the study*), the qualitative studies prevail in every classification, achieving approximately the 44% of the total of the production. These types of journal articles are followed by quantitative studies, achieving almost the 30% of the total. Theoretical studies occupy the third position of the ranking, by gathering approximately the 16% of the total. Studies which combine quantitative and qualitative methods represent slightly more than the 10%.

More precisely, the difference between qualitative and quantitative academical works is considerably less in the English production than in the Spanish one (2 points against 26 in the Spanish classification). However, theoretical studies might be considered as a type of qualitative research, which supposes a tendency of publishing more qualitative articles, especially in the Spanish production. On the contrary, there is a major balance in the nature of articles written in English. As it is been mentioned in the previous variable, the differences among the nature of English and Spanish works could be explained by different traditions of educational research. Other kinds of analysis might complement these findings.

English			Spanish			Total		
Nature	*f*ı	*f*ı %	Nature	*f*ı	*f*ı %	Nature	*f*ı	*f*ı %
Qualitative	34	38.20	Qualitative	49	48.00	Qualitative	83	43.50
Quantitativ e	32	36.00	Quantitative	23	22.50	Quantitative	55	28.80
Mixed	12	13.50	Mixed	11	10.80	Theoretical	30	15.70
Theoretical	11	12.40	Theoretical	19	18.60	Mixed	23	12.00
N	89	100%	N	102	100%	N	191	100%

Table 6: Nature of the study

IV. Conclusions and discussion

The scientific production on the educational use of SNSs in the Spanish and English literature has been analysed throughout the present study. Data concerning the evolution of the scientific production show that the inclusion of SNSs in formal, non-formal, and informal educational times and spaces constitutes a recent phenomenon that has been increasing for the last years. More specifically, although similar trends between the production of articles in English and Spanish have been found, there are also some differences between them over the years. While the first one has expanded the number of publications thus far, the second has had a notable decrease since 2015. This fluctuation might have two explanations. Firstly, that the interest in the educational use and presence of SNSs have become more popular in the English contexts whereas it started reducing in the Spanish ones. Secondly, because of the increasing tendency of publishing articles in English in the academia. Despite these differences, educational implications and responsibility emerge, as interaction, communication, and learning within digital environments is a shared reality that education cannot avoid. Consequently, several questions arise, such as what challenges are emerging with the introduction of SNSs in educational environments, whether educational stakeholders are paying enough attention to this phenomenon, or what the role of education should be in the light of this qualitative change. More research is needed aimed at answering these questions.

Secondly, the interest in the introduction of SNSs in educational practice seems to be higher for Spanish authors, academic journals, and institutions. This statement can be supported by some evidences, such as: (a) a higher amount of publications written in Spanish than English; (b) the majority of the articles written in English as well as almost three quarters of publications written in Spanish coming from Spain; (c) a considerably prevalence of Spanish universities leading academic literature on the educational use of SNSs (even when publishing in English); (d) an important Spanish academic journal on the top of both rankings as well as a larger number of Spanish journals that publish more than English ones; and (e) a higher presence of Spanish works in the selected international databases. It is important to highlight that within the context of publications written in Spanish, just a minority come from Latin American countries (14.42% of the total). This finding might be explained by the lower representation of these countries into the selected databases (only REDIB includes Latin American scientific production). However, this database fosters a total of 1798 academic journals, which is likely to be a similar amount than the Spanish journals that belongs to the analysed databases. Thus, we consider that data related to authorship nationality are reliable for the study. Therefore, it can be said that the Spanish speaking countries are showing a greater interest in the study of SNSs in educational contexts. Following this approach, are SNSs having more presence in the educational practises in Spain than in other

countries? More research is needed in order to find whether this interest emerged from the academia is reflected in a widely use of SNSs in the Spanish educational scenarios.

Another explanation that is likely to understand the high interest of Spanish authors in the analysed topic is the relevance that SNSs have in the Spanish political activism. A clear example is the 15-M Movement (in Spanish *Movimiento 15-M*), an anti-austerity movement that began in SNSs on 15 May 2011 and closed on 22 May with the local and regional elections. In this movement, SNSs not only were the key stones in the birth, but they also were the main responsible for the emerge of the confrontational action, as they were the tool used for organizing and mobilizing the citizens (Barba & Blanco, 2011). In the light of this context, some authors have highlighted the educational possibilities of digital environments in the construction of a democratic culture and active citizenship (Camas, Valero, & Vendrell, 2018; Colás, González, & De Pablos, 2013), which involves a proper use of SNSs by developing both digital and civic competence (Jover, González-Martín, & Fuentes, 2015). Therefore, the promotion of civic education through SNSs constitutes an interesting opportunity in plural, democratic, and hyperconnected societies (Gonzálvez & Contreras, 2014). At the same time, educational authorities and institutions might consider the risks, limitations, and experts' recommendations about the use of SNSs in educational times and spaces. Again, more research is required to deepen in the abovementioned challenge.

Thirdly, as most of the analysed journal articles were written by authors from the same Faculty or college, it is important to mention the potential possibilities that could have collective, interdisciplinary, and international work. As many authors in the field have indicated, because of the effect that international collaboration has on the research, it is regarded as an indicator of high-quality research (Kim, 2006). That is because the formation of collaborative structures allows researchers to enrich from others' knowledge and perspective by broadening their horizons (Grathwol, 2005). Consequently, the outputs are leveraged and increased (Wai-Chan, 2017). Likewise, as SNSs constitute proper spaces for collaboration and participation (Al-rahmi & Zeki, 2017; Cabero & Marín, 2014; Jang, 2015), collective, interdisciplinary, and international projects could be notably promoted. Thus, SNSs could offer numerous possibilities for educational stakeholders, policymakers, and institutions to be engaged and involved in their own practise as active participants in a changing world.

Regarding the content of the academic works we analysed, it is possible to find different tendencies in terms of popularity of SNSs. *Facebook and Twitter* seem to be the most popular sites in both English and Spanish literature, along with a considerably number of articles included in the "Generic" group that covers social media as an undefined cluster. In general terms, frequencies related to other SNSs are quite similar in the English and Spanish production, noticing an important presence of eLearning platforms (4.89%) and the *Web 2.0* (5.86%), which includes a variety of tools such as *Facebook, LinkedIn, YouTube, Google+* or *Twitter.* This presence shows a based link between SNSs and education, especially considering high-impact publications from the selected academic works (Gómez Aguilar, Roses & Farias, 2012; Gao, Luo & Zhang, 2012). However, it is important to consider the fact that the popularity of the different SNSs in academic literature could not correspond necessarily to the real popularity of use among users. Firstly, because participants are not very familiar with the SNSs chosen for the study, constituting a novel experience. Secondly, as the tendencies in the use of SNSs are determined by the accelerate pace of these environments, rapid fluctuations in their popularity arise. Consequently, the artificiality of the participants when using SNSs as a part of the study becomes a possibility. Following this approach, it is worth wondering what the consequences for research on SNSs could be when is not able to get adapted to the real preferences of users. Considering this limitation, academic works should consider only regular users as participants or familiar SNSs as subject of study as well as choosing SNSs on the basis of evidence in terms of popularity of use among youngsters.

Related to the familiarity and popularity is the level of education and the population, which are the variables that achieve the highest trend. Approximately the 70% of the total production on the use of SNSs in education were focused on Tertiary educational contexts, at the same time that a 63.4% chose Tertiary education students as the main collective for the English and Spanish studies. This interest in the aforementioned educational level might have several explanations. Firstly, researchers are more likely to access easily to college students due to its proximity to these contexts. Secondly, in general terms, when they are over 18, they do not need parental authorisation to participate in investigations. This fact accelerates documental issues. Thirdly, as SNSs have become one of the main means of communication among teenagers and young people (Florez, Pardo, Rodríguez, & Simanca, 2014; Froment, García, & Bohórquez, 2017; Gómez, Ferrer & de la Herrán, 2015), they are likely to be more keen on and interested in using them. In fact, Secondary education as educational level and secondary students as population reach the second position in the classification for both English and Spanish literature. Finally, it is worth mentioning that even though we did not consider the specific students' formation into the analysis, most of the research papers had as population teaching students. Therefore, the presence of SNSs in Tertiary education would, indirectly, have an impact on other levels of education, such as Primary or Secondary Education. If so, percentages related to those levels might be higher than in the present analysis. Where papers focused on secondary education achieved nearly the 13% of the total, secondary students had the 16%, and primary students have less than the 3%.

With regard to the educational implications of these variables, SNSs might be motivating environments that make learning more attractive and closer for students. At the same time, SNSs would be an interesting opportunity to promote learning environments based on active methodologies, where shared knowledge among stakeholders arises. As some authors have supported (Khan, Wohn, & Ellison, 2014), this could lead to an improvement on the academic achievement as well as the teacher-student's communication and relationship (Abella & Delgado, 2015; Froment, García & Bohórquez, 2017; Gómez et al., 2015; Hershkovitz & Forkosh-Baruch, 2017). Another implication is related to the need of developing digital literacy among students. Thus, many authors postulate that literacy includes not only digital but also critical competencies. This involves to: distinguish whether information is true or false, educate in responsibility, respect, and critical mistrust (Caro, 2015; Vilchez, 2014), promote the critical discussion of social reality (Porras, 2013), and being producers that comply with ethical standards in the content they create (Renes-Arellano, Caldeiro-Pedreira, del Mar Rodríguez-Rosell, & Aguaded, 2018). The development of these competencies among students results widely relevant for the proper use of SNSs.

Some limitations of this review and recommendation for future research are worth mentioning. With regard to the limitations, this review has three main limitations. The first two are concerned with the used databases and the third to the publication bias. Firstly, due to the fact that three out of the seven databases selected were Spanish language databases, the number of articles written in Spanish is slightly higher than those in English. Nonetheless, due to accessibility along with quality reasons, the aforementioned databases were selected. Secondly, databases such as PsycARTICLES have several non-open access articles. Therefore, it was not possible to consider all the articles related to the study theme. Notwithstanding, the decision of including this database was taken because of the impact of its articles. Finally, the third of the limitations is related to publication bias. Due to the fact that we only included published articles in peer-reviewed journals, a search of the grey literature was not performed. However, the criteria of limiting the search to published literature and peer-reviewed journals ensure a higher quality of the included studies.

For future research, it would be an interesting challenge to make some crossed-variables analysis in order to find more relations among the variables studied. Some of these relations could try to understand whether data related to the nature of the study match with the defined and undefined categories corresponding to the sample, or whether the authorship and journals results are related

to the selected and analysed databases, which SNSs are the most popular in each educational level, what kind of nature prevails in each databases, etc. Moreover, it has also been detected that other studies from a different nature, such as a content analysis or a meta-analysis, could widely complement and even go beyond the present results. These possible works might aim at exploring in depth all the academic literature found on the use of Social Networks Sites in educational Spanish and English contexts.

To conclude, the present work has tried to show the relevance and significance that social media is having in educational scenarios as well as the remarkable interest and presence they have achieved for the last years. As SNSs have become a widely popular phenomenon among countries and cultures, it cannot be disregarded by education. Then, analyses routed to study the scientific production on this topic contribute to the educational implications of using SNSs with educational purposes.

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