

REVIEW ARTICLE

Social media and professional development: a systematic review

Carles Bruguera*, Montse Guitert and Teresa Romeu

*Faculty of Psychology and Education Sciences, Universitat Oberta de Catalunya (UOC),
Barcelona, Spain*

*(Received: 17 June 2019; Revised: 26 September 2019; Accepted: 7 October 2019; Published:
12 November 2019)*

The great popularisation of social media at the beginning of the 21st century has led to the production of many empirical studies in an attempt to explore the opportunities these platforms provide for different activities, such as learning and updating for professionals. This study aims to identify and summarise the main characteristics of research into social media and professional development published between 2013 and 2017. We analysed the years, journals, conceptual background, research methodologies, data collection tools, professional disciplines, educational contexts, types of social media and characteristics of social media that can generate learning opportunities. A total of 44 articles were selected and analysed from peer-reviewed journals. Findings revealed that (1) an upward trend with respect to research on social media and professional development; (2) surveys were the main research method for collecting data about social media; (3) health and education sciences are the most studied fields of knowledge; (4) there is a special interest in the study of social media in informal learning contexts; (5) Twitter is the most studied social media platform and (6) social media seems to be a sustainable support for professional development due to its open, social and flexible nature. Implications of findings for future research are also discussed.

Keywords: lifelong learning; professional development; ICT; social media; literature review

Introduction

The intensive and widespread use of digital technologies by today's society has modified and expanded the way in which people communicate and learn (Donelan 2016). Nowadays, citizens use these technologies for multiple purposes, both in their personal and professional spheres (Hunter and Hall 2018). For professionals, this digital transformation has also meant the need to continuously update their professional knowledge and skills to meet the challenges of the digital era, in what is framed within the idea of 'lifelong learning' or 'professional development' (Collin, Van der Heijden, and Lewis 2012).

Social media have emerged as a prominent element of digital technologies that can be defined as global digital communication platforms. These platforms, which connect large numbers of users producing and exchanging user-generated content, seem able to offer sustainable support for professionals' lifelong learning, thanks to

*Corresponding author. Email: cbrugerat@uoc.edu

characteristics such as the ease with which users are able to create and share content, the breaking down of space and time barriers, and the flexibility and high customisation that its contents and services allow (Ngai, Tao, and Moon 2015; Pérez-Latre, Portilla, and Blanco 2011; Zimmer and Proferes 2014).

Numerous literature reviews have been conducted since the emergence of social media at the beginning of the 21st century, with the purpose of exploring the opportunities offered by these media for learning and updating for professionals. Recent years have seen a proliferation of reviews from health sciences (Cheston, Flickinger, and Chisolm 2013; Curran *et al.* 2017; Lawson and Cowling 2014; Roberts *et al.* 2015; Sterling *et al.* 2017) and education sciences (Gao, Luo, and Zhang 2012; Manca and Ranieri 2015, 2016; Tess 2013).

The particular interest in these two fields of knowledge may be explained by diverse factors. In health sciences, as highlighted by some authors of previous reviews, participation of professionals in professional development activities is sometimes required, whether in courses, conferences, journal clubs or other activities. Another main interest lies in the support that social media can offer to keep up-to-date with current clinical evidence and support the exchange of best professional practices. In education sciences, some authors highlight the teachers' interest in incorporating social media platforms into their professional practice as education tools; interest in using social media to exchange professional practices, evidence and resources; or interest in using social media to enable sustainable networks among professionals. Furthermore, in both fields the use of social media for professional development is also highly valued for helping to overcome geographical, temporal and economic barriers.

The number of literature review-based studies and the results of these studies indicate a research field that is growing and beginning to have an abundant body of data, although reviews mentioned focused in a period of time prior to 2015. Due to the constant developments of social media platforms and the increasing use made by society and its professionals, it is worth considering how research in social media and professional development has evolved in most recent years, from a multidisciplinary prism.

Building on the previous literature reviews and based on some of the most relevant types of information considered in those previous reviews, the aim of this article is to review and analyse the scientific literature on social media and professional development published between 2013 and 2017, to identify and summarise the main characteristics, draw conclusions and point to trends in this field of research.

Methodology

A systematic review provided a summary of the research literature, quantitative and qualitative, using explicit and replicable methods to identify and select relevant studies and objective and replicable techniques to analyse and summarise these studies (Arksey and O'Malley 2005; Cooper 2017).

In line with these authors, a number of steps were followed to ensure a systematic literature review. We describe them below.

Formulation of the research objectives

The first step of the systematic review was to formulate the research objectives. We aimed to identify and summarise the years, journals, conceptual background, research

methodologies, research methods, data collection tools, professional disciplines, educational contexts, types of social media and characteristics of social media capable of generating learning opportunities used in research articles in social media and professional development published between 2013 and 2017.

The key research question we wished to answer was this: What were the main characteristics of the scientific literature on social media and professional development published between 2013 and 2017?

Parameters of the search for articles

The second step of the systematic review was to establish the parameters of the search for articles. To ensure a comprehensive data collection and a multidisciplinary approach, we searched for articles that were indexed in two social sciences reference databases: 'Scopus' and 'ISI Web of Science'. The terms used to search for articles consisted of, on the one hand, a combination of the keywords 'social media' and 'social networks', and a combination of the keywords 'lifelong learning', 'professional development' and 'professional updating', on the other. The use of these terms allowed us to align our search with the search strategies conducted in the previous literature reviews.

The articles chosen had to satisfy the following specific criteria:

1. focus on the relationship between social media and learning;
2. learning approach including professional updating and the lifelong learning of professionals;
3. reporting of empirical data;
4. publication in a journal indexed in Scopus or ISI Web of Science between 2013 and 2017 or identification using the snowball sampling method; and
5. availability in English or Spanish.

In addition, the full text of the article had to be available through the researchers' institutional library subscriptions.

Selection of the studies

The third step of the systematic review consisted in selection and compilation of the studies. The first database consulted was ISI Web of Science. A first search produced 328 results. The results were then filtered by article, reducing the results to 241. Filtering by language to English and Spanish reduced the number of articles to 228. In a first round of reading the abstracts, the filtered results were compared with the established criteria, and the number of articles was reduced to a total of 56. In a second round of a complete reading of the articles, that total was reduced to 30.

The second database consulted was Scopus. A first search produced 426 results. The results were then filtered by article, reducing the number of articles to 262. Filtering by language to English and Spanish reduced the articles to 257 articles. In a first round of reading the abstracts, the filtered results were compared with the established criteria, and the number of articles was reduced to a total of 52. In a second round of a complete reading of the articles, that total was reduced to 34.

Some articles were also selected using the snowball sampling method: the bibliographic references of the articles previously selected were consulted to obtain an additional four articles of interest.

Any duplicate articles (appearing in both databases) were then merged, leaving a final selection of 44 articles. The articles were compiled in Mendeley, and the information were extracted and organised in an extensive spreadsheet.

Data extraction and research analysis

The fourth step of the systematic review consisted of extracting and analysing the information from the selected studies. Before applying the analysis, we decided on the type of information to be extracted from the articles. The name or label of the type of information 'should be suggested by the context in which the event is located' (Strauss and Corbin 2002, p. 116).

Firstly, the 44 articles were collected and organised with the bibliographic data, including article title, authors, journal, abstract, keywords and publication year. Then, 10 additional categories related to the articles were coded, based on those considered in the previous literature reviews, to obtain relevant data useful to cover the basic characteristics of research on social media and professional development. Finally, information from each publication was organised according to the following criteria: (1) year, (2) journal, (3) conceptual background, (4) research methodologies, (5) research methods, (6) data collection tools, (7) professional disciplines, (8) educational contexts, (9) type of social media and (10) characteristics of social media capable of generating learning opportunities.

The different types of information were extracted from the articles in the form of categories. The objective of categorising the types of information was to 'obtain key elements of the information obtained in the research articles' (Arksey and O'Malley 2005, p. 26). A qualitative content analysis was performed. This enabled the information to be organised into categories and subcategories for further analysis (Gibbs 2012). In this qualitative analysis, 'data are broken down into discrete parts, closely examined, and compared for similarities and differences' (Strauss and Corbin 2002, p. 111).

Presentation of results and interpretation

The last step of the systematic review consisted of interpretation of the evidence and presentation of the results. Due to the broad scope of this phase, the results are presented in the following section, with the different types of information analysed organised in separate sections, and using descriptive statistics for more effective description and visualisation.

Results

In this section, we will present the results of the study, organised by the types of information indicated in the previous section.

Years

The articles reviewed were published between 2013 and 2017 (Figure 1).

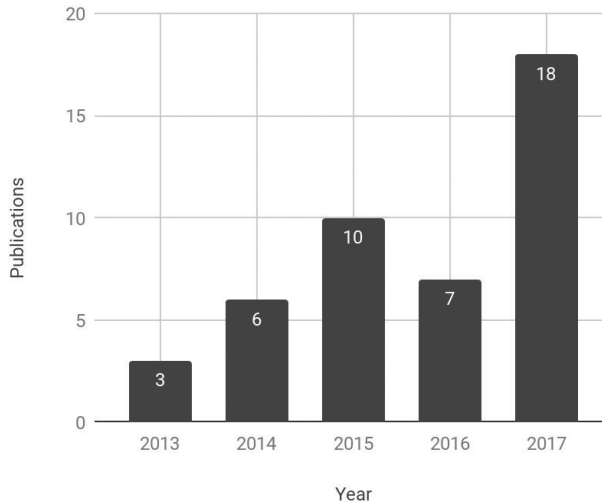


Figure 1. Distribution of number of publications by year.

Journals

The articles were published in 40 different journals. Figure 2 shows the distribution of the articles in journals with two or more articles identified in our review. Three of these journals are relevant to education sciences and two to health sciences.

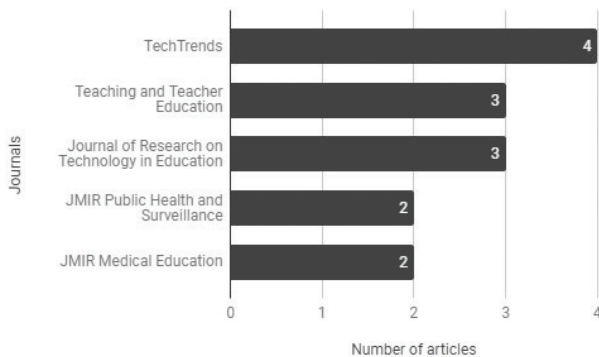


Figure 2. Distribution of journals with two or more articles by number of publications.

Conceptual background

To understand how the different research is conceptually framed, another type of information extracted from the articles and subjected to a categorisation process was the set of conceptual backgrounds of the different articles (Table 1).

By ‘conceptual background’, we refer to the concepts that served as an umbrella to the different empirical studies, provided these were made explicit by the authors of the articles. Concepts that were not clearly specified were categorised within the ‘Not specified’ label. Those closely related were grouped into broader categories. The list is not exhaustive.

Table 1. Distribution of articles by conceptual background and definitions.

Conceptual background	N	%
Personal learning environment (PLE)/Personal learning network (PLN) 'Set of tools, sources of information, connections and activities that each person uses regularly to learn' (Castañeda and Adell 2011, p. 7).	8	20
<i>Community of practice (CoP)</i> 'Learning model based upon the principles of apprenticeship, and cooperative learning' (Davis 2015, p. 1552).	7	17
<i>Teachers' professional development</i> 'Means to improve schools, increase teaching quality, and improve students' academic achievements' (Avidov-Ungar 2016, p. 653).	3	7
<i>Affinity spaces</i> Digital spaces 'where users can interact around topics of shared interest' (Carpenter 2015, p. 211).	3	7
<i>Lifelong learning approach</i> Broad term that encompasses learning throughout life, from early childhood through adulthood (Weber and Vincent 2014).	2	4
<i>Journal clubs</i> Regular meeting of a group of professionals to critically evaluate recent articles in academic literature (Roberts <i>et al.</i> 2015).	1	2
<i>Not specified</i>	15	34

Research methodologies

The studies reviewed used qualitative, quantitative or mixed methodology to carry out their research, as shown in Figure 3.

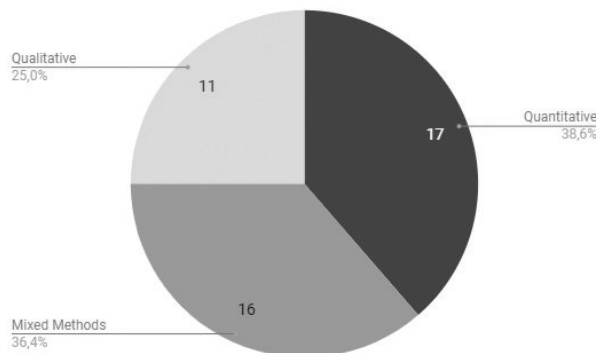


Figure 3. Distribution of research methodologies by publication.

Research methods

The research methods were also identified, as shown in Figure 4.

In this respect, a number of emergent methods related with social media research were identified alongside 'traditional' scientific research methods such as surveys

and interviews, in contrast to the methods found in previous literature reviews. One of these emergent methods is social network analysis (SNA), a methodology for examining the interaction patterns that occur within a group of users, and which is ‘very suitable for the analysis of large quantities of data’ (Rehm, Littlejohn, and Rienties 2018, p. 311). This is also the ‘digital methods’ label, which designates ‘a term that seeks to capture a recent development in Internet-related research related

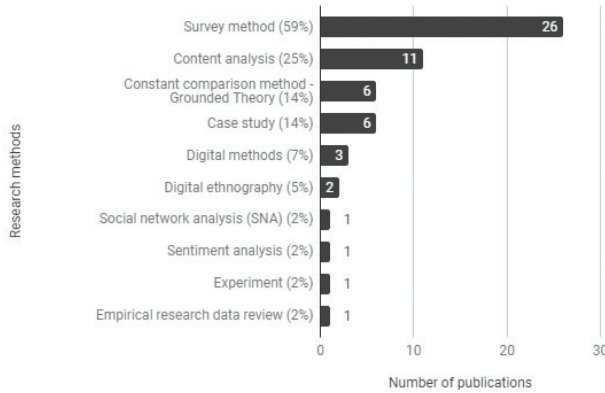


Figure 4. Distribution of research methods by publication.

to the internet, summarised as approaches to the web as dataset’ (Rogers 2005, p. 1, cited in Hutchinson 2016, p. 1).

Data collection tools

In addition to the methodologies and methods, the data collection tools used in the studies were also identified. A distinction must be made between the kind of data obtained through, for example, Twitter or LinkedIn web analytics, and data obtained from content generated and shared on social media through, for example, Twitter posts, YouTube comments or Facebook chats (Figure 5).

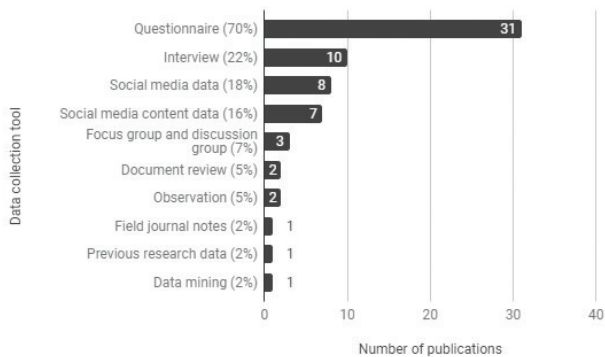


Figure 5. Distribution of data collection tools by publication.

Professional disciplines

Professional disciplines that were the subject of study in the set of articles were also identified and categorised. This categorisation is shown in Figure 6.

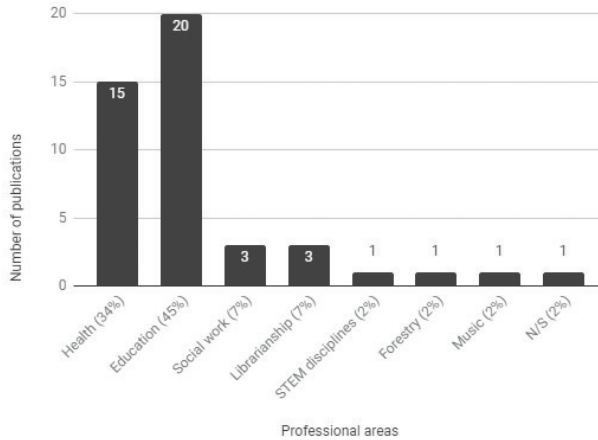


Figure 6. Distribution of professional disciplines by number of publications.

Educational contexts

The educational contexts addressed in the set of articles were also identified, as shown in Table 2. To extract the information related to these contexts, the articles were categorised according to whether they focused on a formal, non-formal or informal learning context.

González-Sanmamed *et al.* (2018) offer useful definitions of each context. Formal education can be defined as ‘formal training that takes place in different organised and structured environments’ (p. 24). Non-formal education, also known as organised informal education, can be defined as ‘activities organised by different institutions that take place outside of what is recognised as regulated training, and may or may not lead to the attainment of a certificate’ (p. 24). Informal education can be defined as the ‘day-to-day learning that occurs in everyday situations (with family, friends, co-workers, etc.). This is not organised, and can occur by chance, in which case it is called incidental’ (p. 25).

Table 2. Distribution of educational contexts by publication.

Educational contexts	Number of articles	%
Informal	32	73
Formal	22	50
Non-formal	19	43

Types of social media

The different social media platforms addressed in the set of studies were also identified (Figure 7).

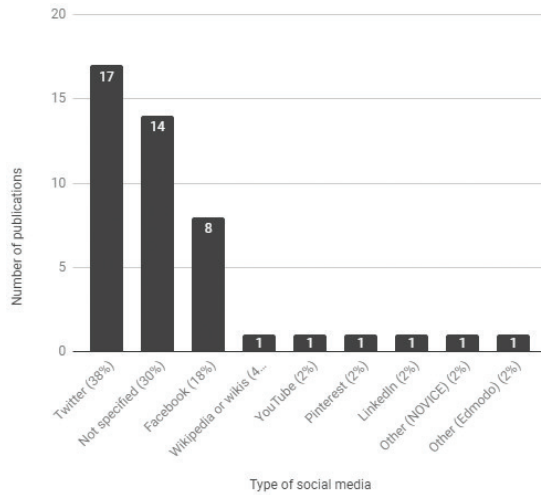


Figure 7. Distribution of social media platform focuses of study by publication.

Characteristics capable of generating learning opportunities

The characteristics of social media that are able to generate the learning opportunities for professional development specified in the conclusions of the set of studies were also categorised. By ‘learning opportunity’, we refer to situations in which learning can be activated. To categorise these characteristics, the Social Media for Learning (SM4L) framework was used.

The SM4L framework aims to demonstrate how students and academics can use social media to promote learning (Middleton and Beckingham 2015); for this study, the original framework was adapted for a professional context. Firstly, the characteristics identified were categorised using the original SM4L framework. Then we removed, modified and added categories and subcategories in a new adaptation, following the qualitative content analysis previously described.

Table 3 shows the most-found characteristics of social media capable of generating learning opportunities as identified in the set of articles. Each characteristic has

Table 3. Distribution of main characteristics that generate learning opportunities found in the articles by publication.

Characteristics that generate learning opportunities	Number of articles	%
Support access to new ideas	29	66
Expand learners’ communication and facilitate interaction and sharing	28	64
Enable connections through social, professional and learning networks	26	59
Support and expand ‘traditional’ learning or professional development	22	50
Promote self-direction, self-regulation, self-expression, enjoyment and confidence of students	22	50
Support open access (geographically extended, democratic, inclusive and user-controlled; free, open and accessible content)	22	50
Widely present and popular in academic and professional spheres	21	48
Support and validate learning through communities of practice	20	45
Accommodate common interests among learners and enable discussion of topics	19	43
Facilitate asking for help or just-in-time information	18	41

been counted independently, more than one characteristic having been identified per study. The list is not exhaustive.

Discussion

This article highlights several points regarding research into social media and professional development. We describe them below.

Upward trend in research into social media and professional development

Firstly, we observed a mostly upward trend in the number of publications during the delimited period from 2013 to 2017, with a slight setback in 2016. The number of articles identified in recent years helps to overcome the 2015 barrier of previous literature reviews and serves to address the need for empirical studies on social media and learning research, which has been pointed out by some authors (Tess 2013). The wide variety of journals in different fields that published the revised articles – 35 in total – is noteworthy. Five journals contributed two or more articles to this review: three from educational sciences and two from health sciences. This increasing number of articles and the great variety of journals that have addressed this field of knowledge seem to indicate an interest in line with the popularisation of social media and the immense amount of space that these media have come to occupy in people's lives (Smith and Anderson 2018).

Strong social component of conceptual backgrounds

We analysed the conceptual approaches of the studies, as long as the authors made it explicit. That was useful to frame social media in the research field and better understand the author's point of view. In the first place, it should be noted that, in almost a quarter of the articles reviewed, the conceptual approaches were not clearly stated beyond a general reference to a particular field of knowledge. Among the articles that made their conceptual background explicit, personal learning environments (PLEs) and personal learning networks (PLNs) were the most-used conceptual frameworks when placing social media in the educational process, especially in a formal context. Other concepts and terms with a marked social component such as 'communities of practice', 'affinity spaces' or 'journal clubs' have acquired a remarkable presence.

Surveys, the main research method for collecting social media data

There is a certain balance among the reviewed articles regarding the use of quantitative, qualitative and mixed methodologies, though the quantitative methodologies are the most prevalent among the set of studies. Of these quantitative methodologies, the survey method was by far the method most used, with questionnaires being the form of data collection most frequently used for obtaining data relevant to social media and learning: more than half of the reviewed articles used questionnaires to collect data, which aligns with results of previous literature reviews. However, a number of methods and techniques tailored to digital environments – encompassed in concepts such as digital methods, digital ethnography or SNA – were observed to have emerged.

Health and education sciences remain the most studied fields of knowledge

Most of the scientific research indicated in previous literature reviews was produced in education and health sciences (Cheston, Flickinger, and Chisolm 2013; Curran *et al.*

2017; Gao, Luo, and Zhang 2012; Lawson and Cowling 2014; Manca and Ranieri 2015, 2016; Roberts *et al.* 2015; Sterling *et al.* 2017), probably for the particularities we described in the introduction section. Although our literature review followed a multidisciplinary approach that did not exclude any field of knowledge or professional sector, we were able to observe that the education and health sectors remained the fields with the highest concentration of studies. We can state that most of the interest is still coming from these two fields. Research in the health sector covered the greatest variety of professional disciplines, in a broad spectrum ranging from radiology to paediatrics. Research in the educational sector was focused mainly on higher education, probably because of its greater accessibility to researchers.

Special interest in the informal learning context

There was cross-disciplinary interest in studying the incidence of social media in different learning contexts, though the informal learning context was the most frequently studied. Previous reviews showed a slightly greater interest in the study of social media in formal contexts. In our review, interest in the formal context seemed related to the way in which social media could be effective as an educational tool. In the non-formal context, interest seemed to be related to determining how these media could support and extend ‘traditional’ learning or professional development activities such as conferences, courses or journal clubs. In the informal context, interest was broader and more diverse. Firstly, there was interest in studying the ‘spontaneous’ and ‘general’ use of social media made by users in their daily lives. Then there was interest in the self-directed learning of individuals enabled and empowered by social media. And thirdly, there was also interest in the informal use of social media by citizens in their educational or professional contexts and activities.

Twitter, the most cited social media platform

With respect to social media platforms, Twitter was the most studied social media platform in our literature review. While Twitter was not the social medium most used by Internet users, it seems to have an active presence in the professional life of citizens, serving as a platform for professional global digital communication. This focus on Twitter is aligned with the growing interest indicated in some of the previous reviews (Zimmer and Proferes 2014). Facebook, the most widely used social media platform in general use today (Smith and Anderson 2018), was the most visited platform after Twitter. Twitter may have become the preferred platform over other platforms such as Facebook ‘due to advantages such as short-form messaging, easily grouped themes with hashtags, and rapid spread of messages (going viral) with easy sharing through retweeting’ (Goodyear, Casey, and Quennerstedt 2018).

Characteristics that generate learning opportunities are markedly open, social and accessible

The many and varied characteristics of social media capable of generating learning opportunities were categorised using an adaptation of the SM4L framework (Middleton and Beckingham 2015). Among the many characteristics to emerge from the set of studies, we would highlight opportunities derived from (1) the openness of social media, especially in terms of access to new ideas that allow people to keep up to date

with diverse aspects of their profession, overcoming spatial, temporal and economic barriers; (2) the multiple communication and sharing options that these media allow by enabling different forms of interaction between users and (3) by being authentically situated in the professional field and familiar to most users; (4) the diverse types of personal or professional networks facilitated by social media and (5) the user-centred focus, especially conducive to self-directed and informal learning. These characteristics seem defining when thinking about social media for professional development and its applications for professionals' learning and updating.

Conclusions

This systematic literature review analysed and synthesised 5 years of research in social media and professional development, covering years and disciplines not covered in the previous literature review. The review helps to point to the existing academic interest in the possibilities of social media for supporting professionals in their learning and professional development in different learning contexts. Also, it shows the way research has been done, in terms of methodology, and the kind of evidence obtained.

Our review provides new information to that generated in the previous reviews, which did not consider the research carried out beyond 2015. In this sense, we would like to highlight some of the main characteristics found. Firstly, although surveys prevail as the main method to collect data, emerging methods such as digital methods are being increasingly implemented, being indicated as especially useful when analysing the large amount of data generated in digital contexts. Secondly, Twitter has a very prominent situation in the professional context compared to other social media platforms, especially to get updated information useful for keeping up-to-date professionally and connecting with other professionals. Thirdly, the study of social media and professional development is focusing more on informal learning contexts. While in previous reviews there was a slightly greater focus on social media within formal learning contexts, many of the authors of our review focus on the informal use of social media and its implications for learning. Fourthly, research in social media and professional development is still addressed primarily in the fields of education and health, although in our review we observed a growing interest in other professional fields, such as social work, librarianship, Science, Technology, Engineering and Mathematics (STEM) disciplines, forestry and music.

From the review we conducted, we also observed that numerous empirical studies coincide in indicating that social media can be a useful communication platform and serve as open and rich digital spaces for professionals to exchange information, opinions and ideas. Overcoming geographical, temporal and economic barriers is one of the key points to use them for professional development purposes. In addition, the speed with which social media content is updated is pointed out as also very relevant, though we also found serious concerns about what are referred to as privacy conflicts.

Despite the huge popularisation of social media platforms such as Facebook, Twitter, Instagram and YouTube in the last decade, some authors pointed out that research into social media and professional development is still at an incipient stage (Ngai, Tao, and Moon 2015) and, although progress is being made, a greater amount of empirical data still needs to be generated. As an overall conclusion, our findings

suggest that a considerable amount of data has been generated in recent years, although these data are a bit chaotic and loosely connected.

Several points of interest and possible future lines of study emerged from the results of this literature review. Firstly, informal use of social media seems to require further study because much of social media use occurs outside formal and non-formal settings and for purposes other than learning. One question that arises in this respect is whether social media platforms can be incorporated into formal contexts for educational purposes, or whether the true virtue of these media is the informal, spontaneous and self-directed use made of them by their users. More research into social media and professional development outside the disciplines of education and health sciences is also needed to help meet the needs and peculiarities of the different groups of professionals in today's society.

Research into social media needs to acknowledge that social media platforms are constantly evolving and adding new features to their service. Facebook or Twitter today has new features compared to the Facebook and Twitter of 10 years ago. In addition, other digital products, such as WhatsApp or Spotify, are incorporating more and more social network features into their functionalities, making it difficult to mark the boundary between what is social media and what is not. In any case, what seems clear is that the evolution of digital technologies, the social web and mobile devices has fostered a societal need for open, social and accessible platforms of communication that allow us to connect with other people and generate and share content in a simple way while offering us an attractive functionality and design. We believe, then, that research should focus not on specific platforms, but on what these platforms can enable in terms of learning and communication possibilities.

As we have seen from the review conducted, conceptual approaches with a social and technological emphasis such as *PLE* and *PLN*, *communities of practice* and *affinity spaces* were used to locate social media in the process of learning and updating for professionals. In this respect, the learning ecologies framework – defined by Barron (2004) as ‘the set of contexts composed of configurations of activities, resources and relationships that are generated in physical or virtual spaces and that offer learning opportunities’ (p. 6) – could be highly useful in determining how professionals currently learn. This ecological vision of how people learn could enable professionals to learn how to organise their learning ecology better, update themselves professionally, understand the role of social media in the framework of their learning ecology and be aware of the benefits these media can offer for their lifelong learning process.

Funding

This work was supported by the Government of Catalonia as part of the ‘Grants for the recruitment of early-stage research staff (FI-2018)’ initiative.

References

- * Abella, V. & Delgado, V. (2015) ‘Aprender a usar Twitter y usar Twitter para aprender’, *Profesorado*, vol. 19, no. 1, pp. 364–378. Available at: <http://mendeley.csuc.cat/fitxers/f1b181d0f1a1e56355d5ff6b9cc518fb>

*The references marked with an asterisk make up the 44 empirical studies reviewed.

- * Alshiekhly, U., et al., (2015) 'Facebook as a learning environment for teaching medical emergencies in dental practice', *Education for Health*, vol. 28, no. 3, pp. 176–180. <http://doi.org/10.4103/1357-6283.178609>
- * Alsobayel, H. (2016) 'Use of social media for professional development by health care professionals: a cross-sectional web-based survey', *JMIR Medical Education*, vol. 2, no. 2, p. e15. <http://doi.org/10.2196/mededu.6232>
- Arksey, H. & O'Malley, L. (2005) 'Scoping studies: towards a methodological framework', *International Journal of Social Research Methodology: Theory and Practice*, vol. 8, no. 1, pp. 19–32. <http://doi.org/10.1080/1364557032000119616>
- * Baker, L. R. & Hitchcock, L. I. (2017) 'Using Pinterest in undergraduate social work education: assignment development and pilot survey results', *Journal of Social Work Education*, vol. 53, no. 3, pp. 535–545. <http://doi.org/10.1080/10437797.2016.1272515>
- Barron, B. (2004) Learning Ecologies for Technological Fluency: Gender and Experience Differences', *Journal of Educational Computing Research*, vol. 31, no. 1, pp. 1–36. <https://doi.org/10.2190/1N20-VV12-4RB5-33VA>
- * Bogdanou, T., et al., (2013) 'Use of the internet and social media in the forestry profession in the United Kingdom', *International Forestry Review*, vol. 15, no. 2, pp. 147–159. <http://doi.org/10.1505/146554813806948521>
- * Bolderston, A., et al., (2018) 'Twitter journal clubs and continuing professional development: an analysis of a #MedRadJClub tweet chat', *Radiography*, vol. 24, no. 1, pp. 3–8. <http://doi.org/10.1016/j.radi.2017.09.005>
- * Britt, V. G. & Paulus, T. (2016) "Beyond the four walls of my building": a case study of #Edchat as a community of practice', *American Journal of Distance Education*, vol. 30, no. 1, pp. 48–59. <http://doi.org/10.1080/08923647.2016.1119609>
- * Carpenter, J. (2015) 'Preservice teachers' microblogging: professional development via Twitter', *Contemporary Issues in Technology and Teacher Education*, vol. 15, no. 2, pp. 1–21. Available at: <http://mendeley.csuc.cat/fixers/dbb45a25ed2f92ba576751590c7ce764>
- * Carpenter, J. P. & Krutka, D. G. (2014) 'How and why educators use Twitter: a survey of the field', *Journal of Research on Technology in Education*, vol. 46, no. 4, pp. 414–434. <http://doi.org/10.1080/15391523.2014.925701>
- * Carpenter, J. P. & Krutka, D. G. (2015) 'Engagement through microblogging: educator professional development via Twitter', *Professional Development in Education*, vol. 41, no. 4, pp. 707–728. <http://doi.org/10.1080/19415257.2014.939294>
- * Carpenter, J. P., Tur, G. & Marin, V. I. (2016) 'What do U.S. and Spanish pre-service teachers think about educational and professional use of Twitter? A comparative study', *Teaching and Teacher Education*, vol. 60, pp. 131–143. <http://doi.org/10.1016/j.tate.2016.08.011>
- * Cartner, H. C. & Hallas, J. L. (2017) 'Challenging teachers' pedagogic practice and assumptions about social media', *Online Learning*, vol. 21, no. 2, pp. 1–21. <http://doi.org/10.24059/olj.v21i2.1009>
- * Cartwright, L. (2017) 'Supporting students to use social media and comply with professional standards', *Social Work Education*, vol. 36, no. 8, pp. 880–892. <http://doi.org/10.1080/02615479.2017.1372409>
- Castañeda, L. & Adell, J. (2011) 'El desarrollo profesional de los docentes en entornos personales de aprendizaje (PLE)', in *La práctica educativa en la Sociedad de la Información: Innovación a través de la investigación*, eds R. Roig Vila & C. Laneve, Marfil, pp. 83–95. Spain: Marfil. ISBN: 978-84-268-1563-7
- * Chaoyan, D., et al., (2015) 'Using LinkedIn for continuing community of practice among hand surgeons worldwide', *Journal of Continuing Education in the Health Professions*, vol. 35, no. 3, pp. 185–191. <http://doi.org/10.1002/chp.21300>
- Cheston, C. C., Flickinger, T. E. & Chisolm, M. S. (2013, June) 'Social media use in medical education: a systematic review', *Academic Medicine*, vol. 88, no. 6, pp. 893–901. Lippincott Williams and Wilkins. <http://doi.org/10.1097/ACM.0b013e31828ffc23>

- * Chretien, K., *et al.*, (2015) 'A digital ethnography of medical students who use Twitter for professional development', *JGIM: Journal of General Internal Medicine*, vol. 30, no. 11, pp. 1673–1680. <http://doi.org/10.1007/s11606-015-3345-z>
- Collin, K., Van der Heijden, B. & Lewis, P. (2012) 'Continuing professional development', *International Journal of Training and Development*, vol. 16, no. 3, pp. 155–163. <https://doi.org/10.1111/j.1468-2419.2012.00410.x>
- * Cooner, T. S. (2014) 'Using Facebook to explore boundary issues for social workers in a networked society: students' perceptions of learning', *British Journal of Social Work*, vol. 44, no. 4, pp. 1063–1080. <http://doi.org/10.1093/bjsw/bcs208>
- Cooper, H. M. (2017) *Research Synthesis and Meta-analysis: A Step-by-Step Approach*. Los Angeles, CA: Sage. ISBN: 978-1-4833-4705-9
- Curran, V., *et al.*, (2017) 'A review of digital, social, and mobile technologies in health professional education', *Journal of Continuing Education in the Health Professions*, vol. 37, no. 3, pp. 195–206. <http://doi.org/10.1097/CEH.0000000000000168>
- * Currie, G., *et al.*, (2017) 'Twitter Journal Club in medical radiation science', *Journal of Medical Imaging and Radiation Sciences*, vol. 48, no. 1, pp. 83–89. <http://doi.org/10.1016/j.jmir.2016.09.001>
- * Davis, K. (2015) 'Teachers' perceptions of Twitter for professional development', *Disability and Rehabilitation*, vol. 37, no. 17, pp. 1551–1558. <http://doi.org/10.3109/09638288.2015.1052576>
- * Donelan, H. (2016) 'Social media for professional development and networking opportunities in academia', *Journal of Further and Higher Education*, vol. 40, no. 5, pp. 706–729. <http://doi.org/10.1080/0309877X.2015.1014321>
- * Ford, C. & Tolmie, D. (2016) 'Breaking the limits of time and space: how Twitter is helping #medlibs collaborate and communicate. A descriptive study', *Journal of Hospital Librarianship*, vol. 16, no. 2, pp. 116–131. <http://doi.org/10.1080/15323269.2016.1150737>
- * Fuoco, M. & Leveridge, M. J. (2015) 'Early adopters or laggards? Attitudes toward and use of social media among urologists', *BJU International*, vol. 115, no. 3, pp. 491–497. <http://doi.org/10.1111/bju.12855>
- Gao, F., Luo, T. & Zhang, K. (2012) 'Tweeting for learning: a critical analysis of research on microblogging in education published in 2008–2011', *British Journal of Educational Technology*, vol. 43, no. 5, pp. 783–801. <http://doi.org/10.1111/j.1467-8535.2012.01357.x>
- Gibbs, G. R. (2012) *El análisis de datos cualitativos en Investigación Cualitativa*. Madrid: Ediciones Morata, S. L. ISBN: 978-84-7112-675-7
- González-Sanmamed, M., *et al.*, (2018) 'Ecologías de aprendizaje en la Era Digital: desafíos para la Educación Superior', *Publicaciones*, vol. 48, no. 1, pp. 11–38. <http://doi.org/10.30827/PUBLICACIONES.V48I1.7329>
- * Goodyear, V. A., Casey, A. & Quennerstedt, M. (2018) 'Social media as a tool for generating sustained and in-depth insights into sport and exercise practitioners' ongoing practices', *Qualitative Research in Sport, Exercise and Health*, vol. 10, no. 1, pp. 1–16. <http://doi.org/10.1080/2159676X.2017.1367715>
- * Hamad, F., Tbaishat, D. & Al-Fadel, M. (2017) 'The role of social networks in enhancing the library profession and promoting academic library services: a comparative study of the University of Jordan and Al-Balqaa' Applied University', *Journal of Librarianship and Information Science*, vol. 49, no. 4, pp. 397–408. <http://doi.org/10.1177/0961000616656043>
- * Hart, M., *et al.*, (2017a) 'Twitter and public health (Part 1): how individual public health professionals use Twitter for professional development', *JMIR Public Health and Surveillance*, vol. 3, no. 3, p. e60. <http://doi.org/10.2196/publichealth.6795>
- * Hart, M., *et al.*, (2017b) 'Twitter and public health (Part 2): qualitative analysis of how individual health professionals outside organizations use microblogging to promote and disseminate health-related information', *JMIR Public Health and Surveillance*, vol. 3, no. 4, p. e54. <http://doi.org/10.2196/publichealth.6796>

- Hunter, L. J. & Hall, C. M. (2018) 'A survey of K-12 teachers' utilization of social networks as a professional resource', *Education and Information Technologies*, vol. 23, no. 2, pp. 633–658. <http://doi.org/10.1007/s10639-017-9627-9>
- Hutchinson, J. (2016) 'An introduction to digital media research methods: how to research and the implications of new media data', *Communication Research and Practice*, vol. 2, no. 1, pp. 1–6. <http://doi.org/10.1080/22041451.2016.1155307>
- * Jackson, H. T., et al., (2017) 'Sages foregut surgery collaboration: a surgeon's social media resource for collaboration, education and professional development', *Surgical Endoscopy and Other Interventional Techniques*, vol. 31, p. 43. <http://doi.org/10.1007/s00464-017-5444-x>
- * Kelly, N. & Antonio, A. (2016) 'Teacher peer support in social network sites', *Teaching and Teacher Education*, vol. 56, pp. 138–149. <http://doi.org/10.1016/j.tate.2016.02.007>
- * Khan, A. & Du, J. T. (2017) 'Professional development through social media applications: a study of female librarians in Pakistan', *Information and Learning Science*, vol. 118, no. 7/8, pp. 342–353. <http://doi.org/10.1108/ILS-04-2017-0028>
- * Klein, M., Niebuhr, V. & D'Alessandro, D. (2013) 'Innovative online faculty development utilizing the power of social media', *Academic Pediatrics*, vol. 13, no. 6, pp. 564–569. <http://doi.org/10.1016/j.acap.2013.07.005>
- * Kleynhans, A. C., Oosthuizen, A. H. & van Hoving, D. J. (2017) 'Emergency medicine educational resource use in Cape Town: modern or traditional?', *Postgraduate Medical Journal*, vol. 93, pp. 250–255. <http://doi.org/10.1136/postgradmedj-2016-134135>
- * Krutka, D. G., Carpenter, J. P. & Trust, T. (2017) 'Enriching professional learning networks: a framework for identification, reflection, and intention', *TechTrends*, vol. 61, no. 3, pp. 246–252. <http://doi.org/10.1007/s11528-016-0141-5>
- Lawson, C. & Cowling, C. (2014) 'Social media: the next frontier for professional development in radiography', *Radiography*, vol. 21, no. 2, pp. 74–80. <http://doi.org/10.1016/j.radi.2014.11.006>
- * Lee, C. S., et al., (2017) 'Making sense of comments on YouTube educational videos: a self-directed learning perspective', *Online Information Review*, vol. 41, no. 5, pp. 611–625. <http://doi.org/10.1108/OIR-09-2016-0274>
- * Li, J. & Greenhow, C. (2015) 'Scholars and social media: tweeting in the conference back-channel for professional learning', *Educational Media International*, vol. 52, no. 1, pp. 1–14. <http://doi.org/10.1080/09523987.2015.1005426>
- * Li, X., et al., (2017) 'Understanding health professionals' informal learning in online social networks: a cross-sectional survey', *Studies in Health Technology and Informatics*, vol. 239, pp. 77–83. <http://doi.org/10.3233/978-1-61499-783-2-77>
- * Maloney, S., et al., (2017) 'Continuing professional development via social media or conference attendance: a cost analysis', *JMIR Medical Education*, vol. 3, no. 1, p. e5. <http://doi.org/10.2196/mededu.6357>
- Manca, S. & Ranieri, M. (2015) 'Implications of social network sites for teaching and learning. Where we are and where we want to go', *Education and Information Technologies*, vol. 22, no. 2, pp. 605–622. <http://doi.org/10.1007/s10639-015-9429-x>
- Manca, S. & Ranieri, M. (2016) 'Is Facebook still a suitable technology-enhanced learning environment? An updated critical review of the literature from 2012 to 2015', *Journal of Computer Assisted Learning*, vol. 32, no. 6, pp. 503–528. <http://doi.org/10.1111/jcal.12154>
- Middleton, A. & Beckingham, S. (2015) 'Social media for learning: a framework to inspire innovation', in *Smart Learning: Teaching and Learning with Smartphones and Tablets in Post-Compulsory Education*. MELSIG, Sheffield Hallam University, pp. 46–56. Available at: <http://shura.shu.ac.uk/9615/>
- Ngai, E., Tao, S. & Moon, K. (2015) 'Social media research: theories, constructs, and conceptual frameworks', *International Journal of Information Management*, vol. 35, no. 1, pp. 33–44. <http://doi.org/https://doi.org/10.1016/j.ijinfomgt.2014.09.004>

- Avidov-Ungar, O. (2016) 'A model of professional development: teachers' perceptions of their professional development', *Teachers and Teaching*, vol. 22, no. 6, pp. 653–669. <http://doi.org/10.1080/13540602.2016.1158955>
- Pérez-Latre, F. J., Portilla, I. & Blanco, C. S. (2011) 'Social networks, media and audiences: a literature review', *Comunicación y Sociedad*, vol. 24, no. 1, pp. 63–74. ISBN: 0214-0039
- * Rehm, M., Littlejohn, A. & Rienties, B. (2018) 'Does a formal wiki event contribute to the formation of a network of practice? A social capital perspective on the potential for informal learning', *Interactive Learning Environments*, vol. 26, no. 3, pp. 308–319. <http://doi.org/10.1080/10494820.2017.1324495>
- * Rehm, M. & Notten, A. (2016) 'Twitter as an informal learning space for teachers!? The role of social capital in Twitter conversations among teachers', *Teaching and Teacher Education*, vol. 60, pp. 215–223. <http://doi.org/10.1016/j.tate.2016.08.015>
- * Rickels, D. A. & Brewer, W. D. (2017) 'Facebook Band Director's Group: member usage behaviors and perceived satisfaction for meeting professional development needs', *Journal of Music Teacher Education*, vol. 26, no. 3, pp. 77–92. <http://doi.org/10.1177/1057083717692380>
- Roberts, M. J., et al., (2015) 'Globalization of continuing professional development by journal clubs via microblogging: a systematic review', *Journal of Medical Internet Research*, vol. 17, no. 4, pp. 1–11. <http://doi.org/10.2196/jmir.4194>
- * Rodesiler, L. (2017) 'Local social media policies governing teachers' professionally oriented participation online: a content analysis', *TechTrends*, vol. 61, no. 3, pp. 293–300. <http://doi.org/10.1007/s11528-016-0139-z>
- * Romero-Hall, E. (2017) 'Posting, sharing, networking, and connecting: use of social media content by graduate students', *TechTrends*, vol. 61, no. 6, pp. 580–588. <http://doi.org/10.1007/s11528-017-0173-5>
- * Schaper, E., et al., (2013) 'How do German veterinarians use social networks? A study, using the example of the "NOVICE" veterinary medicine network', *GMS Zeitschrift Fur Medizinische Ausbildung*, vol. 30, no. 1, pp. 1–22. <http://doi.org/10.3205/zma000855>
- Schwenk, E. S., et al., (2017) 'Upgrading a social media strategy to increase Twitter engagement during the spring annual meeting of the American Society of Regional Anesthesia and Pain Medicine', *Regional Anesthesia and Pain Medicine*, vol. 42, no. 3, pp. 283–288. ISSN: 1098-7339. <http://doi.org/10.1097/AAP.0000000000000586>
- Smith, A. & Anderson, M. (2018) *Social Media Use in 2018*. Washington, DC. Available at: www.pewresearch.org
- Sterling, M., et al., (2017) 'The use of social media in graduate medical education: a systematic review', *Academic Medicine*, vol. 92, no. 7, pp. 1043–1056. <http://doi.org/10.1097/ACM.0000000000001617>
- Strauss, A. L. & Corbin, J. M. (2002) *Bases de la investigación cualitativa : técnicas y procedimientos para desarrollar la teoría fundada*. Medellín: Editorial Universidad de Antioquia, Facultad de Enfermería de la Universidad de Antioquia. ISBN: 9586556247
- * Sumner, E., Esfer, S. & Yildirim, S. (2014) 'Teachers' Facebook use: their use habits, intensity, self-disclosure, privacy settings, and activities on Facebook', *Educational Studies*, vol. 40, no. 5, pp. 537–553. <http://doi.org/10.1080/03055698.2014.952713>
- * Thangasamy, I. A., et al., (2014) 'International urology journal club via twitter: 12-month experience', *European Urology*, vol. 66, no. 1, pp. 112–117. <http://doi.org/10.1016/j.eururo.2014.01.034>
- Tess, P. A. (2013) 'The role of social media in higher education classes (real and virtual)-A literature review', *Computers in Human Behavior*, vol. 29, no. 5, pp. A60–A68. <http://doi.org/10.1016/j.chb.2012.12.032>
- * Trust, T. (2017) 'Motivation, empowerment, and innovation: teachers' beliefs about how participating in the Edmodo Math Subject Community shapes teaching and learning', *Journal of Research on Technology in Education*, vol. 49, no. 1–2, pp. 16–30. <http://doi.org/10.1080/15391523.2017.1291317>

- * Tur, G. & Marín, V. I. (2014) 'Enhancing learning with the social media: student teachers' perceptions on Twitter in a debate activity', *Journal of New Approaches in Educational Research*, vol. 4, no. 1, pp. 46–59. <http://doi.org/10.7821/naer.2015.1.102>
- * Veletsianos, G. (2017) 'Three cases of hashtags used as learning and professional development environments', *TechTrends*, vol. 61, no. 3, pp. 284–292. <http://doi.org/10.1007/s11528-016-0143-3>
- * Visser, R. D., Evering, L. C. & Barrett, D. E. (2014) 'TwitterforTeachers: the implications of Twitter as a self-directed professional development tool for K-12 teachers', *Journal of Research on Technology in Education*, vol. 46, no. 4, pp. 396–413. <http://doi.org/10.1080/15391523.2014.925694>
- * Wagner, J. P., et al., (2017) 'Professional use of social media among surgeons: results of a multi-institutional study', *Journal of Surgical Education*, vol. 75, no. 3, pp. 804–810. <http://doi.org/10.1016/j.jsurg.2017.09.008>
- * Weber, Z. A. & Vincent, A. H. (2014) 'Facebook as a method to promote a mindset of continual learning in an ambulatory care pharmacy elective course', *Currents in Pharmacy Teaching and Learning*, vol. 6, no. 4, pp. 478–482. <http://doi.org/10.1016/j.cptl.2014.04.009>
- Zimmer, M. & Proferes, N. J. (2014) 'A topology of Twitter research: disciplines, methods, and ethics', *Aslib Journal of Information Management*, vol. 66, no. 3, pp. 250–261. <http://doi.org/10.1108/AJIM-09-2013-0083>