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#any use? What do we know about how teachers and doctors learn through social media use?

Journal Item

Special issue
Reshaping professional learning
in the social media landscape:
theories, practices and challenges

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Indice

#any use? What do we know about how teachers and doctors learn through social media use?

Alison Fox*, Terese Bird**

Abstract

This scoping literature review describes the landscape of recent publications (2007-2016) about how teachers and doctors learn through social media to identify whether learning was being considered and, if so, how evidence was collected (N=162). Sixty-seven percent (N=108) were teacher-related and thirty-three percent (N=54) doctor-related, covering empirical studies, literature reviews, position articles and letters to academic journals. Empirical studies were dominant – ninety-one percent (N=98) of teacher-related and sixty-one percent (N=33) of doctor-related – with both fields dominated by in-course evaluations and use/attitude studies. Although doctor-related articles focused on professional online behaviour, rather than professional learning, conference communication and information evaluation were interesting areas of enquiry. Despite professional interest in social media in these professions, there is a dearth of academic studies about their benefits for teacher and doctor learning.

Keywords: social media; professional learning; medical education; teacher education

* The Open University, UK.
** University of Leicester, UK.
Corresponding author: Alison Fox, alison.fox@open.ac.uk

1. Introduction

This article aims to map the landscape of academic study about social media use by professionals to ascertain where research is taking place, of what nature and whether it concerns learning, particularly of the professionals involved. Our driver is the perception that, increasingly over the last decade, society is pressuring professionals in ways likely to close down, rather than open up, their exploration of social media for learning due to ethical concerns. We chose two professions, teaching and medicine, in which there is professional activity (in policies and training) around social media use but dominated by how to avoid bringing the profession into disrepute, rather than how to use it effectively.

Social media use in these 'caring' professions has sparked international media attention. Headlines such as 'Schoolteacher sacked after parents spot Facebook video of her twerking on US holiday' (News Corp Australia Network, 2016) and 'Infatuated patients use Facebook to stalk doctors' (Campbell, 2012) highlight negative aspects of social media use by teachers and doctors. In response both professions have developed national or state-wide codes of conduct (General Medical Council, 2013; Victoria State Government, 2013) with guidance to protect professionals from detrimental implications of 'unprofessional conduct' on social media (Department for Education, 2014). In the UK, social media risk avoidance training is now built into the first weeks of initial teacher and medical training courses and compliance is expected (British Medical Association, 2011; The King's School, 2015). The same is true for schools, colleges, General Practice surgeries and healthcare trusts, with individual organisations setting advice, usually guided by professional associations and unions (e.g. UK: Association for School and College Leaders, 2016; Medical Defence Union, 2017).

We are concerned that research which could provide an evidence base for professionals to evaluate their social media use to maximise its value for professional learning is being stifled and wanted to learn whether academic research is moving at all counter culture, offering evidence which could act as antidote. We also searched for synergies across research in two professions under similar pressures.

This article reviews literature from the last decade (2007-2016) to identify the nature and availability of studies which examine teacher and doctor professional learning through social media, to identify relevant studies and to look across the two fields for opportunities for further research which would benefit both professions. Although the ultimate aim of the review was to identify studies pertaining to teachers of young people, and doctors who work face-to-face with patients in hospital or general practice settings, it was anticipated such studies would be limited. This exploratory, scoping review therefore spread the net widely to include higher education teachers, including those educating teachers and medical students. 'Doctors' refers to a broad range of medical professionals and 'Teachers' to a range of educators.

2. Professional learning as participation: a role for social media

We assert there is indisputably a potential role for social media use in professional learning. It is widely accepted that learning is a social activity. Both social constructivism and socio-cultural views based on a participatory model (Sfard, 1998) accept the role played by others in learning. The social participatory metaphor grounds the very practical building of social media platforms (Krutka & Carpenter, 2016; Rheingold, 2012); sometimes theorised through the notion of connectivism (Downes, 2006; Siemens, 2011). Tools such as Twitter, Facebook and Instagram are referred to as social networking sites (SNS) because of the way they network people to other nodes (people, organisations, groups) (Ellison & boyd, 2013).

The value of both offline and online personal networks has been used to explain professional learning particularly in the context of social capital building (Lin, 2001; Wellman, 2002); as applied to education (Daly, 2010; Deal et al., 2009; Fox & Wilson, 2009); and in medicine (Wright, 2016). Whilst it may be assumed in modern society that all professionals are connected digitally through communication which could be considered social networking (e.g. email groups, listserves, YouTube, Slideshare and Flickr), we cannot assume that they have engaged with social network sites (Brown, Ryan, & Harris, 2014; Merchant, 2012; Owen, Fox, & Bird, 2016) or with social me-

dia more broadly, encompassing more personal media such as blogs, collaborative platforms such as Wikipedia and content communities such as YouTube (Kaplan & Haenlein, 2010; Tess, 2013). We were aware that some authors might also refer to Web 2.0 technologies or use the term interchangeably with social media (Kaplan & Haenlein, 2010; O'Reilly, 2005). This scoping review was interested in capturing academic activity covering all these terms: mapping which terms the authors used helped to capture the landscape of academic activity.

Although interest in the potential for social media to create a space for learning is not new (Davies & Merchant 2009; Greenhow & Robelia, 2009) we wondered whether it had thrived or been curtailed in the particular social context of teacher and doctor professional learning, when it is accepted social media engagement requires a time investment and may lead to unintended consequences and even threaten careers.

3. Aims of this review

The review questions were the following:
1. What nature of studies (between 2007 and 2016) are being carried out into the social media use of teachers and doctors?
2. Whose learning is being considered and how is it being studied?
3. What evidence is being collected about how teachers and doctors learn professionally from social media?

The answers to these questions would map the landscape of research capable of informing these professions and, by looking for cross-professional synergies, identify future areas for study.

4. The review methodology

This literature review is characterised as a scoping review (Paré, Trudel, Jaana, & Kitsiou, 2015) through its broad scope of research question; holistic search strategy; acceptance of empirical and theoretical (position piece) articles; formation of a dataset; lack of priority to quality appraisal of the studies (due to the exploratory, mapping nature of the review); and thematic approach to analysis to generate the findings.

Teacher-related articles were sought using key education data-bases: British Education Index, ERIC and SCOPUS using key terms 'social media', 'social networking sites' 'web 2.0' AND 'education' or 'learning' AND 'teachers'. As a further strategy a number of key specialist journals related to technology-enhanced learning (Innovations in Education and Teaching International, International Journal of Web-based Communities, International Journal of Continuing Engineering Education and Lifelong Learning, International Journal of Social Media and Interactive Learning Environments, Learning, Media and Technology, Teaching and Teacher Education) were searched to identify further articles.

For medical literature, 'doctors'[1] replaced 'teachers' in the search strategy. Both an online search using key medical research databases SCOPUS and PubMed and a hard copy search of medical journals held by a UK Copyright University library[2] were carried out. Although no specialist journals related to technology-enhanced learning were identified, a number of journals which had generated multiple items were searched (Emergency Medicine Journal, Journal of General Internal Medicine, Medical Education, Medical Teacher, Teaching and Learning in Medicine). A further online search revealed some key articles published outside peer-reviewed academic journals, in what is often termed grey literature (Microsoft Research Technology Festival, MOI Intervention, Pharmaphorum.com), but were included as relevant to the review's aims. All abstracts of both teacher and medical articles were reviewed and articles read to complete a database of the articles' content according to headings:

- Author(s)
- Year

[1] The term 'doctor' included a range of medical professionals, sometimes also referred in the literature as physicians, medics, surgeons (which were also accepted in the review). The term doctor does not refer to Doctors of Philosophy or those with Professional Doctorates (although those in the medical profession might hold these qualifications). It did not extend to related professions such as dentistry, optometry, physiotherapy, occupational health etc.

[2] https://en.oxforddictionaries.com/definition/copyright_library.

- Article title
- Journal title
- Journal volume/issue/page numbers
- Type of article: Empirical; Position article; Literature review; Letter to editor with data; Letter to editor; Editorial
- Whose learning: School students (for teaching profession); Undergraduate students; Preservice teachers or doctors (medical students); Professionals (teachers or doctors); Postgraduate students; University faculty; Patients; Patient-doctor relationships (which referred to doctor learning); Undefined
- Social media focus (as defined in the article)[3]: Social media; Social networking sites (generally); Web 2.0; Named tool/platform e.g. Facebook, Blog
- Key findings (Qualitative summary)
  For the empirical studies:
- Number of participants: Less than 50; 51-150; 151-300; 301-500; 501-1000; 1001-5000; 5001-7000
- Location (Country or countries)
- Research instruments (as described in the article)

Articles were sorted and analysed to generate responses to these headings. This analysis was verified by both authors. Due to the scoping nature of the review, no ratings or inter-researcher reliability metric was applied. Verification focused on sharing perceptions of article relevance, understandings of article foci and findings to agree database entries by heading. Articles were excluded if learning was not discussed at all.

5. Findings

5.1. Learning focus, nature, and tools

In terms of the nature of studies (review question 1), of the 162 articles reviewed, 67% (N=108) were teacher-related and 33% (N=54)

[3] Given that this was a scoping review we were interested in how authors were referring to their interests and therefore recorded and accepted whichever term was defined as the focus for the article (e.g. social media, Web 2.0, social networking sites or named tools/platforms).

doctor-related (see Table 1). Empirical studies were dominant for teachers (N=98, 91%) and for doctors (N=33, 61%). Some referred broadly to Web 2.0 (N=7,7% of teacher-related and N=9, 16% of doctor-related articles) or social media (N=22, 20% of teacher-related and N=17, 32% of doctor-related articles). Some focused on SNS generally (N=14, 13% of teacher-related and N=10, 19% of doctor-related articles) or individual named sites. The latter were particularly prevalent in teacher-related articles, with the dominant attention paid to Facebook (N=36, 33% compared to N=11, 20% of doctor-related articles), followed by Twitter (N=11, 10% of teacher-related and N=7, 13% of doctor-related articles). Other individual tools included blogs, discussion fora[4], wikis, video sharing and other named SNS tools.

It was not always possible to discern whose learning was an article's focus. Where identifiable most attention in the teacher-related literature was paid to learning in higher education settings of undergraduate students (N=39, 38%), preservice teachers (N=10, 9%), postgraduate students (N=9, 8%) and faculty members (N=8, 8%). In-service teacher learning was limited to 17 articles (16%), with some reference to teacher learning in articles whose principal focus was on how they supported school children's learning (N=11, 10%).

Of those articles identifiable in doctor-related literature, the majority (N=21, 39%) covered the learning of in-service medical practitioners in various disciplines. Medical students' learning featured in N=11, 20% of the articles, with some reference to doctor learning in articles principally focused on other topics such as patient-doctor relationships (a further N=3, 6%) or patient attitudes. One paper (2%) concerned patient learning.

Before we turn to the empirical articles we consider the literature reviews and position articles identified.

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[4] Discussion fora, while not platforms themselves, perform similar functions to social media platforms: they facilitate discussion in public on the Internet. Therefore, we maintain they are social media tools and included them in this review.

Table 1. Nature of articles, social media tool focus and identification of learning setting

Profession	Nature of article		Tools		Whose learning (if specified)	
	Empirical study	93	Facebook	36	Undergraduate students	39
	Literature	11	Social	14	Undefined	19
	review	3	Blogging	12	School teachers	11
	Position article	1	Twitter	11	School children	11
	Theoretical	0	Web 2.0	7	Preservice teachers	10
			Wikis	4	Postgraduate students	9
Teachers N=108			Social media	2	University faculty	8
			Ning	2	Adult education	1
			Discussion	1		
			Forum	1		
			Myspace	1		
			Pinterest	1		
			Video Sharing	1		
	Empirical study	33	Social media	17	Professional physicians	21
	Position article	11	Fscebook	11	Undefined	
	Literature	4	Social	10	Medical students	18
Doctors N=54	review	3	Web 2.0	9	Patient-Doctor	11
	Letters with data	2	Twitter	7	relationships	3
	Editorials	1	Blogging	1	Patients	1
			Youtube	1		

5.2. The nature of studies covered in previous literature reviews

We draw attention to literature reviews already conducted in both bodies of literature: 12 in education (Table 1) and 4 in medicine (Table 2).

Table 1. Literature reviews in the teaching professions

Topic	Review	Number of articles
SNS in education broadly	Dominguez-Flores (2013)	Unknown
	Rodríguez-Hoyos et al. (2015)	62
	Stewart (2015)	Unknown
	Stornaiuolo et al. (2013)	43
	Tess (2013)	Unknown
Facebook use in educational setting	Aydin (2012)	Unknown
	Hew (2012)	36
	Manca & Ranieri (2013)	23
	Manca & Ranieri (2016a)	147
	Timonidou et al. (2013)	19
	Yang et al. (2011)	21
Twitter use in educational settings	Gao et al. (2012)	21

In terms of review question 2, these literature reviews confirm that the majority of teacher-related studies into social media use are in higher education settings (e.g. 82% of the 62 articles reviewed by Rodríguez-Hoyos et al., 2015; 82% of the 23 articles reviewed by Manca and Ranieri (2013) and the sole learning setting for the reviews of Hew (2012), Tess (2013), Timonidou, Zotou, Tambouris and Tarabanis. (2013), Yang, Wang, Woo and Quek (2011).

Teacher and medical education contexts, as a sub-set of broader studies into higher education teaching, were little highlighted and the reviews noted only six studies of teachers and doctors in practice (in-service) contexts. These articles (Bahner et al., 2012; Edwards-Groves, 2011; Goodyear, Casey & Kirk, 2014; Holotescu & Grosseck, 2011; Palmquist & Barnes, 2015; Ranieri, Manca, & Fini, 2012) were included in our review as separate items.

The four literature reviews in the field of medicine were less dominated by studies in higher education than those in education (Table 2).

Table 2. Literature reviews in the medical professions

Topic	Review	Number of articles
Social media broadly	Hollinderbäumer et al. (2013)	20
SNS use	Griffiths et al. (2012)	101 (and 9 websites)
	von Muhlen & Ohno-Machado (2012)	50
Medical school policies about social media use	Kaczmarczyk et al. (2013)	128 online policies

5.3. A role for 'position' articles in the teacher- and doctor-related literature

A notable publication type was the position piece: articles presenting arguments related to professional use of social media without reference to a full empirical study and, within the medical literature, including a number of letters and editorials.

In education three position pieces concluded that, whilst there is some promotion of social media use within the professions (Lieberman & Pointer Mace, 2010; McNee, 2010), this is to overcome a professional emphasis on risks and perceived abuses (Fenwick, 2016).

In medicine the larger number (N=11) of position pieces all offered advice for healthcare professionals; either to an undefined general professional audience (Greysen et al., 2010; Guseh, Brendel, & Brendel, 2009; Hempel, Neef, Rotzoll, & Heinke, 2013; Jain, 2009); or more specific fields such as medical education (Brown, 2010; George & Green, 2012; Jeffries & Szarek, 2010), surgery (Weinstein, Saadeh, & Warren, 2011) or emergency medicine (Roland & Brazil, 2015). These position pieces acknowledged the challenges of social media but concluded an over-riding need for professional training accepting an inevitability that the profession should engage with these media. It was here that a voice was found to counteract the professional clampdown on social media use.

Conversely letters to editors identified in academic journals (Gorrindo, Gorrindo, & Groves 2008; Yildirim, Basaran, & Alatas 2015) offered more negative responses to academic articles or presentations. In three cases an evidence base was called upon, albeit not presented in a full academic format (Chretien, Azar, & Kind, 2011; Nomura, Genes, Bollinger, Bollinger, & Reed, 2012; Yildirim et al., 2015). These

focused on examining: the accuracy of information in YouTube videos (Yildirim et al., 2015), incidences of unprofessional behaviour (Chretien et al., 2011) and advocated caution in social media use by medical professionals. Only Nomura and colleagues (2012) letter drew attention to the potential benefits for professionals at conferences.

5.4. Evidence of how teachers and doctors learn professionally through social media

To reflect on evidence collected about how teachers and doctors learn professionally through social media (review question 3) the location, the scale, in terms of numbers of participants, and the data collection and analytic methods used are summarized (see Table 3).

Most studies in both sectors originated in the USA, followed by the UK, then Europe, Asia, Australasia and, in the case of medicine, South America, and were largely small-scale higher education impact studies related to courses. Both fields yielded a few large-scale studies. Two medical studies surveyed about 3000 participants by online questionnaire of UK medical students' (Sandars & Schroter, 2007) and USA students, residents, and practicing doctors (Bosslet, Torke, Hickman, Terry, & Helft, 2011). Two education studies surveyed over 6000 Italian higher education faculty (Manca & Ranieri, 2016b) and nearly 80,000 tweets connected to German education (Rehm & Notten, 2016).

Dominant methods were either content analysis of social media postings and profiles, and/or surveys by questionnaire. Some post and profile analyses involved social network analysis, five of them in education (Jimoyiannis & Angelaina, 2012; Rehm & Notten, 2016; Smith Risser, 2013; Tirado, Hernando, & Aguaded 2015; Wright, White, Hirst, & Cann, 2014) and one in medical education (Lulic & Kovic, 2013). Pertinent to this review's interests in collecting evidence about professional learning were those which analysed posts qualitatively. We identified the following studies in education: Luehmann & Tinelli (2008), Tirado et al. (2015), Rutherford (2013), Aaen (2015), Wood (2012) and in medicine: Lagu, Kaufman, Asch and Armstrong (2008), Chretien et al. (2011), Roland and colleagues (Roland, May, Body, Carley, & Lyttle 2015a & b). The next most prevalent method was interview often as part of small-scale multiple-method case studies, usually of teacher-student social media use on courses, and often linked to a survey tool or post analysis.

Table 3. Overview of empirical studies published about social media use in the teaching and medical professions

Professions	Location of the studies (some of which covered multiple locations, alphabetically)		Number of participants		Methods (some studies covered multiple methods)	
Teachers N=76	Australia	6	Less than 50	29	Content analysis	23
	Canada	2	51-150	13	Questionnaire	21
	China	2	151-300	14	Interviews	10
	Denmark	2	301-500	6	Network analysis	6
	Finland	2	501-1000	2	Behavioural data	5
	Greece	4	1001-5000	4	Profile analysis	4
	Hong Kong	2	5001-7000	2	Focus groups	4
	Israel	2	Unspecified	6	Assessments	4
	Italy	4			Performance data	3
	Japan	3			Case studies	1
	Malaysia	5			Journals	1
	Norway	2			Adobe sessions	1
	South Corea	2				
	Spain	2				
	Taiwan	4				
	Thailand	4				
	Turkey	4				
	U.K.	12				
	UAE	2				
	USA	15				
Doctors N=34	Australia	2	Less than 50	1	Questionnaire	9
	Brazil	1	51-150	3	Content analysis	9
	Canada	1	151-300	8	Interviews	4
	France	1	301-500	0	Profile analysis	2
	Germany	2	501-1000	2	Journals	2
	Korea	1	1001-5000	2	Networ analysis	1
	Nepal	1	Unspecified	8	Focus Groups	1
	New Zeland	1				
	U.K.	5				
	USA	17				

6. Discussion

Teacher-related studies about teacher learning

In the teacher-related articles four types of study are discussed in relation to their dominant purposes and evidence collected about teacher learning.

The most prevalent type of study focused on *individual tools*, the dominant being Facebook, which featured some of the largest scale studies of teachers' learning (Rutherford, 2013; Aaen, 2015; Ranieri et al., 2012). This first theme overlapped with the second, studies *evaluating the integration of social media into courses.* The extent to which researchers were truly open-minded in anticipating the outcomes is sometimes debatable, as the implicit mission for these studies seemed to be to identify evidence which supported the use of a tool or strategy to promote the practices. The third theme covered studies exploring *use of and attitudes to social media* by teachers as potential support for teaching and learning, although few studies (e.g. Owen et al., 2016; Carpenter, Tur, & Marin, 2016) directly explored this with school teachers. The final theme related to the *continuing professional development of teachers*, including the way they engage with social media as a form of self-regulated learning. These were least prevalent (Aaen, 2015; Goodyear et al., 2014; Luehmann & Tinelli, 2008; Rutherford, 2013; Wood, 2012) but significant to the aims of this review.

Doctor-related articles related to doctor learning

A similar analysis of doctor-related articles identified five study foci. Whilst two of these overlapped with those of teacher-related articles (use and attitude to social media and evaluations of the use of social media in courses), three (professional online behaviour, conference communication and evaluations of information shared by social media) were distinct to medical publications.

It was evident that considerable attention was being paid to what constitutes acceptable *professional online behaviour* by doctors. Studies of this kind, whilst not about professional learning directly, illustrate the context for academic activity, as was the aim of review ques-

tion 1. Like the critique levied at academics looking to support the promotion of social media tools integrated into courses (also prevalent in the doctor-related literature), such studies seemed to search to prove the significance of their concerns to drive caution in use and influence policy guidance.

As with teacher-related literature there were studies usually involving large-scale surveys of medical students about *professionals' use and attitudes to social media* (e.g. Sandars & Schroter, 2007). Similarly, although less frequently, some doctor-related studies in higher education settings evaluated their *integration of social media into courses*, with only Spedding and colleagues (Spedding, Jenner, Potier, Mackway-Jones, & Carley 2013) examining learning and practice change. A niche sphere of activity in doctor-related literature, absent in education, was the potential for social media to enhance conference communication – and hence, implicitly, doctor learning. These studies focused on Twitter use and were particularly prevalent in the field of Emergency Medicine (e.g. Neill, Cronin, Brannigan, O'Sullivan, & Cardogan, 2014; Roland et al., 2015a & b). This attention to *accuracy of information* shared through social media reflects a wider concern, translated into academic attention. Whilst articles not included in this review looked at the implications of variable accuracy of information from a patients' perspective, a few studies considered the implications for professional doctors (Hughes, Joshi, Lemonde, & Wareham, 2009; Pimmer, Linxen, & Gröhbiel, 2012) and agreed that awareness raising and skill development in data provenance and quality should be included in initial medical education.

Synergies drawn from this cross-professional review

Professionally, doctors and teachers face similar contexts in terms of their social media use, including consequences of misuse as professionals. Academically, inappropriate social media use is highlighted in medical, and hardly at all in education, literature. The main similarity in academic attention between these two literatures is that paid to higher education contexts for teaching and learning. The high number of empirical studies in these settings is providing opportuni-

ties to hear about how training teachers and doctors use and wish to use social media for their learning. The studies do not always focus on professional learning but, rather, are gathering a body of knowledge about the use, attitudes, concerns and benefits of social media use for these professions. Although this is a valuable evidence base, building on the work of this and other literature reviews, further research is needed to more fully inform professionals about effective social media use as part of their ongoing continuing professional learning.

Looking across the published work in these two professions, clues are given into possible areas to explore. Educational researchers might, firstly, examine social media use associated with conferences/events towards a fuller understanding of the potential for social media to inform participants, those unable to attend in person, and provide real-time feedback and stimulation to presenters. Secondly, studies might evaluate the quality of information disseminated. However, 'accuracy' of information in education might be less easy to discern than in medicine, given teachers are not always searching for scientific knowledge and mis-information may not have the safety implications as in medicine. In turn doctor-related research could draw on the broad range of educational research into course integration and evaluation of social media use and reflect on where, without dedicated technology-enhanced learning journals, research findings about social media use can be shared across medical specialities.

Further articles like those reporting participant benefits should be encouraged. Productive methodological approaches include social media post analysis to discern categories of benefits and mixed methods designs to both gather patterns of views at scale and interrogate smaller numbers of individuals' learning experiences. Further contributions could extend to reveal the implications of social media use for practice change. Rather than focusing on individual tool use, how professionals select tools and use multiple tools, how they integrate personal and professional networks, how they integrate online and offline networking are questions ripe for research. Similarly, conceptual work, based on views of knowledge and learning, would make contributions. Future work might also examine factors such as gender,

professional role and cultural context seems a more prominent factor in doctor rather than teacher-related literature.

It is expected that, as data mining and 'big data' analytic techniques develop, further large-scale studies will be possible, which do justice to the scale of social media participation and interactivity. Whilst data harvesting in these new online spaces, researchers will need to consider their ethical responsibilities and respond to the particular challenges of social media data, in terms of consent and data protection (Association of Internet Researchers, 2012). Ethical concerns were largely ignored in the articles reviewed.

6.1. Limitations

We accept that this review has been largely descriptive. With such a disparate terminology describing social media in published work, the first challenge was to select search criteria to bound the review. The second was the difficulty in accessing medical literature: publication in this field was fragmented, mostly focused within particular medical disciplines, such that articles covering learning and social media were isolated entries. University libraries, even with a Medical School, do not subscribe to all these journals. Therefore a hard copy search of a UK copyright library was useful to identify those not available digitally. The third challenge was to categorise the literature comparably across the two bodies of literature. Rather than focus on only the few studies related to classroom teacher and frontline doctor learning, we prioritized breadth, acknowledging that this compromised in-depth analysis. In part our breadth reflected a view that educational and medical professional development is a long-term process which includes pre-service training into career-long learning. We felt this justified including undergraduate and postgraduate learning studies. The trade-off is that some valuable questions have been left unanswered.

7. Conclusion

This article maps the landscape of academic study in the area of social media use by doctors and teaching professionals to describe the activity and whether it regards learning, particularly of the professionals in-

volved. Our concerns were realised. The review concludes that research is not taking place to provide an evidence base for professionals to evaluate their social media use, although a few articles were useful for thinking about responsible and valuable social media use for professional learning. This article has not adopted a particular view of learning, as its purpose was rather to see if researchers were carrying out studies in which learning was a focus. A further task would be to examine the kind of theorisations being applied in these studies and reflect on such contributions. In conclusion, this paper is the precursor to a more systematic analysis of articles about professional learning and social media use. It concludes that there is limited activity in this area but that academics of one 'caring' profession might be inspired by the academics studying another as to what and how they might research in this worthwhile area. Hopefully this will encourage academics to be brave enough to counter societal concerns about teachers and doctors using social media and provide professionals with evidence empowering them to evaluate and maximise their use of social media for professional learning.

References

NB. Cited articles included in the dataset of the review are Appended.

Association for School and College Leaders (2016). *ASCL guidance: Social Networking, Social Media and Email. Protecting your professional reputation*. Leicester, UK: ASCL. Retrieved from: http://www.ascl.org.uk/help-and-advice/guidance-articles/ascl-guidance-social-networking-social-media-and-email.html.

Association of Internet Researchers (2012). *Ethical Decision-Making and Internet Research*. Version 2.0. Retrieved from: https://aoir.org/ethics/.

British Medical Association (2011). *Using social media: practical and ethical guidance for doctors and medical students*. London: BMA. Retrieved from: http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Using+social+media+:+practical+and+ethical+guidance+for+doctors+and+medical+students#0 .

Campbell, D. (2012). Infatuated patients use Facebook to stalk doctors. *The Observer*, 28, October 2012. Retrieved from: https://www.theguardian.com/society/2012/oct/28/lovesick-patients-stalk-doctors-online.

Daly, A. J. (2010). *Social network theory and educational change*, Cambridge, MA: Harvard University Press.

Davies, J., & Merchant, G. (2009). *Web 2.0 for schools: Learning and social participation*. New York, NY: Peter Lang.

Deal, T. E., Purinton, T., & Waetjen, D. C. (2009). *Making sense of social networks in schools.* Thousand Oaks, CA: Corwin Press.

Department for Education (2014). *Cyberbullying: Advice for headteachers and school staff*. Retrieved from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/374850/Cyberbullying_Advice_for_Headteachers_and_School_Staff_121114.pdf.

Downes, S. (2006). Learning networks and connective knowledge. *Collective intelligence and elearning*, *20*(1), 1-26.

Ellison, N. B., & boyd, d. (2013). Sociality through Social Network Sites. In W. H. Dutton (Ed.), *The Oxford Handbook of Internet Studies (*pp. 151-172). Oxford, UK: Oxford University Press.

Fox, A., & Wilson, E. (2009). "Support our networking and help us belong!": listening to beginning secondary school science teachers. *Teachers and Teaching: Theory and Practice*, *15*(6), 701-718.

General Medical Council (2013). *Doctors' use of social media.* London, UK: General Medical Council. Retrieved from: http://www.gmc-uk.org/guidance/ethical_guidance/21186.asp.

Greenhow, C., & Robelia B. (2009). Informal learning and identity formation in online social networks. *Learning, Media and Technology*, *34*(2), 119-140.

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of social media. *Business Horizons*, 53(1), 59-68.

Krutka, D. G., & Carpenter, J. P. (2016). Participatory learning through social media: How and why social studies educators use Twitter. *Contemporary Issues in Technology and Teacher Education*, *8*(2), 100-107.

Lin, N. (2001). Building a network theory of social capital. In N. Lin, K. Cook, & R.S. Burt (Eds.), *Social Capital: Theory and Research* (pp. 3-29). New York, NY: Aldine de Gruyter.

Medical Defence Union (2017). Guide to social media. Ireland: MDU. Retrieved from: https://www.themdu.com/guidance-and-advice/guides/guide-to-social-media.

Merchant, G. (2012). Unravelling the social network: theory and research. *Learning, Media and Technology*, *37*(1), 4-19.

News Corp Australia Network (2016). *Schoolteacher sacked after parents spot Facebook video of her twerking on US holiday*, 11 April 2016. Retrieved from: http://www.news.com.au/technology/online/social/schoolteach-

er-sacked-after-parents-spot-facebook-video-of-her-twerking-on-us-holiday/news-story/3d261ee326f587207acba1c25a7a3f3b.

O'Reilly, T. (2005). *What Is Web 2.0? Design Patterns and Business Models for the Next Generation of Software*. Retrieved from: http://www.oreilly.com/pub/a/web2/archive/what-is-web-20.html.

Owen, N. I, Fox, A., & Bird, T. M. (2016). Surveying UK teachers' use (not use) and attitudes to social media: a methodological approach. *International Journal of Research & Method in Education*, *39*(2), 170-183.

Paré, G., Trudel, M. C., Jaana, M., & Kitsiou, S. (2015) Synthesizing information systems knowledge: A typology of literature reviews. *Information & Management*, *52*(2), 183-199.

Rheingold, H. (2012) *Net smart: How to thrive online*. Cambridge, MA: MIT Press.

Sfard, A. (1998). On Two Metaphors for Learning and the Danger of Choosing Just One, *Educational Researcher*, *27*(2), 4-13.

Siemens, G. (2011). Special Issue - Connectivism: Design and Delivery of Social Networked Learning. *International Review of Research in Open and Distance Learning*, *12*(1), 1-5.

The King's School (2015). *E-Safety & Social Media Policy*. Canterbury, UK. Retrieved from: https://www.kings-school.co.uk/fileadmin/user_upload/PDF/Policies/E-Safety_and_Digital_Media_Policy_-_December_2015_-_December_2017.pdf.

Victoria State Government (2013). *Professional Codes of Conduct*, Victoria, Australia: VSG. Retrieved from http://www.education.vic.gov.au/school/principals/health/Pages/lolsocialmediacodes.aspx.

Wellman, B. (2002). Little boxes, glocalization, and networked individualism. In M. Tanabe, P. Besselaar, & T. Ishida (Eds.), *Digital cities II: Computational and sociological approaches*, Berlin: Springer.

Wright, K. (2016). Social Networks, Interpersonal Social Support, and Health Outcomes: A Health Communication Perspective. *Frontiers in Communication*, *1*(1),10-11.

Appendix: Cited papers included in database of the review.

Aaen, J. (2015). Making Sense of Facebook: A Mixed Methods Approach to Analysing Online Student Groups. *Seminar.net - International journal of media, technology and lifelong learning*, *11*(1), 1-7.

Aydin, S. (2012). A review of research on Facebook as an educational environment. *Educational Technology Research and Development*, *60*(6), 1093-1106.

Bahner, D. P., Adkins, E., Patel, N., Donley, C., Nagel, R., & Kman, N. E. (2012). How we use social media to supplement a novel curriculum in medical education. *Medical Teacher*, *34*(6), 439-444.

Bosslet, G. T., Torke, A. M., Hickman, S. E., Terry, C. L., & Helft, P. R. (2011). The patient-doctor relationship and online social networks: Results of a national survey. *Journal of General Internal Medicine*, *26*(10), 1168–1174.

Brown, A. D. (2010). Social media: A new frontier in reflective practice. *Medical Education 44*(8), 744-745.

Brown, J., Ryan, C., & Harris, A. (2014). How doctors view and use social media: a national survey. *Journal of Medical Internet Research*, *16*(12), e267.

Carpenter, J. P., Tur, G., & Marin, V. I. (2016). What do US and Spanish pre-service teachers think about educational and professional use of Twitter? A comparative study. *Teaching & Teacher Education*, *60*(1), 131-143.

Chretien, K. C., Azar, J., & Kind, T. (2011). Physicians on Twitter. *JAMA*, *305*(6), 566.

Dominguez-Flores, N. (2013). The change from weblogs to social networks to develop lifelong learners. *International Journal of Continuing Engineering Education and Lifelong Learning*, *23*(1), 6-17.

Edwards-Groves, C. J. (2011). The multimodal writing process: changing practices in contemporary classrooms. *Language and Education*, *25*(1), 49-64.

Fenwick, T. (2016). Social media, professionalism and higher education: a sociomaterial consideration. *Studies in Higher Education*, *41*(4), 664-677.

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*, *43*(5), 783-801.

George, D. R., & Green, M. J. (2012). Beyond Good and Evil: Exploring Medical Trainee Use of Social Media. *Teaching and Learning in Medicine*, *24*(2),155-157.

Goodyear, V. A., Casey, A., & Kirk, D. (2014). Tweet me, message me, like me: Using social media to facilitate pedagogical change within an emerging community of practice. *Sport, Education & Society*, *19*(7), 927-943.

Gorrindo, T., Gorrindo, P. C., & Groves, J. E. (2008). Intersection of Online Social Networking with Medical Professionalism: Can Medicine Police the Facebook Boom? *Journal of General Internal Medicine*, *23*(12), 2155-2155.

Greysen, S. R., Kind, T., & Chretien, K. C. (2010). Online professionalism and the mirror of social media. *Journal of General Internal Medicine*, *25*(11), 1227-1229.

Griffiths, F., Cave, J. A. K., Boardman, F., Ren, J., Pawlikowska, T., Ball, R., Clarke, A., & Cohen, A. (2012). Social networks – the future for health care deliver. *Social Science & Medicine*, *75*(12), 2233-2241.

Guseh, J. S., Brendel, R. W., & Brendel, D. H. (2009). Medical professionalism in the age of online social networking. *Journal of Medical Ethics*, *35*(9), 584-586.

Hempel, G., Neef, M., Rotzoll, D., & Heinke, W. (2013). Study of medicine 2.0 due to Web 2.0?! Risks and opportunities for the curriculum in Leipzig. *GMS Zeitschrift fur medizinische Ausbildung*, *30*(1), Doc11.

Hew, K. F. (2011). Students' and teachers' use of Facebook. *Computers in Human Behavior*, *27*(2), 662-676.

Hollinderbäumer, A., Hartz, T., & Uckert, F. (2013). Education 2.0 - how has social media and Web 2.0 been integrated into medical education? A systematical literature review. *GMS Zeitschrift für medizinische Ausbildung*, *30*(1), Doc14.

Holotescu, C., & Grosseck, G. (2011). Mobile learning through microblogging. *Procedia Social and Behavioral Sciences*, *15*(1), 4–8.

Hughes, B., Joshi, I., Lemonde, H., & Wareham, J. (2009). Junior physician's use of Web 2.0 for information seeking and medical education: A qualitative study. *International Journal of Medical Informatics*, *78*(10), 645-655.

Jain, S. H. (2009). Practicing Medicine in the Age of Facebook. *New England Journal of Medicine*, *361*(7), 649-651.

Jeffries, W. B., & Szarek, J. L. (2010). Tag This Article! Today's learners and the use of Web 2.0 in teaching. *Molecular Interventions*, *10*(2), 60–64.

Jimoyiannis, A., & Angelaina, S. (2012). Towards an analysis framework for investigating students' engagement and learning in educational blogs. *Journal of Computer Assisted Learning*, *28*(3), 222-234.

Kaczmarczyk, J. M., Chuang, A., Dugoff, L., Abbott, J. F., Cullimore, A. J., Dalrymple, J., Davis, K. R., Hueppchen, N. A., Katz, N. T., Nuthalapaty, F. S., Pradhan, A., Wolf, A., & Casey, P.M. (2013). e-Professionalism: A New Frontier in Medical Education. *Teaching & Learning in Medicine*, *25*(2), 165-170.

Lagu, T., Kaufman, E. J., Asch, D. A., & Armstrong, K. (2008). Content of weblogs written by health professionals. *Journal of General Internal Medicine*, *23*(10), 1642-1646.

Lieberman, A., & Pointer Mace, D. (2010). Making Practice Public: Teacher Learning in the 21st Century. *Journal of Teacher Education*, *61*(1-2), 77-88.

Luehmann, A. L., & Tinelli, L. (2008). Teacher professional identity development with social networking technologies: learning reform through blogging. *Educational Media International*, *45*(4), 323-333.

Lulic, I., & Kovic, I. (2013). Analysis of emergency physicians' Twitter accounts. *Emergency Medicine Journal*, *30*(5), 371-376.

Manca, S., & Ranieri, M. (2013). Is it a tool suitable for learning? A critical review of the literature on Facebook as a technology-enhanced learning environment. *Journal of Computer Assisted Learning*, *29*(1), 487-504.

Manca, S., & Ranieri, M. (2016a). 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*, *32*(2), 503-528.

Manca, S., & Ranieri, M. (2016b). "'Yes for sharing, no for teaching!': Social Media in academic practices". *The Internet and Higher Education*, *29*(1), 63-74.

McNee, N. (2010). "What's my email address anyway Miss?" Communicating with the Facebook generation'. *Cultural Heritage UKOLN blog*, [online] Retrieved from: http://blogs.ukoln.ac.uk/cultural-heritage/page/2010/01/27/whats-my-email-address-anyway-miss/index.html.

von Muhlen, M., & Ohno-Machado, L. (2012). Reviewing social media use by clinicians. *Journal of the American Medical Informatics Association*, *19*(5), 777-781.

Neill, A., Cronin, J. J., Brannigan, D., O'Sullivan, R., & Cardogan, M. (2014). Impact of social media on a major international Emergency Medicine conference. *Emergency Medicine Journal*, *31*(1), 401-404.

Nomura, J. T., Genes, N., Bollinger, H. R., Bollinger, M., & Reed, J. F. (2012). Twitter use during emergency medicine conferences. *American Journal of Emergency Medicine*, *30*(5), 819-20.

Owen, N. I, Fox, A., & Bird, T. M. (2016). Surveying UK teachers' use (not use) and attitudes to social media: a methodological approach. *International Journal of Research & Method in Education*, *39*(2), 170-183.

Palmquist, J. E., & Barnes, G. V. (2015). Participation in the School Orchestra and String Teachers Facebook v2 group: An online community of practice. *International Journal of Community Music*, *8*(1), 93-103.

Pimmer, C., Linxen, S., & Gröhbiel, U. (2012). Facebook as a learning tool? A case study on the appropriation of social network sites from mobile phones in developing countries. *British Journal of Educational Technology*, *43*(5), 726-738.

Ranieri, M., Manca, S., & Fini, A. (2012). Why (and how) do teachers engage in social networks? An exploratory study of professional use of Face-

book and its implications for lifelong learning. *British Journal of Educational Technology*, *43*(5), 754-769.

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*, *60*(1), 215-223.

Rodríguez-Hoyos, C., Haya Salmón, I., & Fernández-Díaz, E. (2015). Research on SNS and education: The state of the art and its challenges. *Australasian Journal of Educational Technology*, *31*(1), 100-111.

Roland, D., & Brazil, V. (2015). Top 10 ways to reconcile social media and "traditional" education in emergency care. *Emergency Medicine Journal*, *32*(10), 819-822.

Roland, D., May, N., Body, R., Carley, S., & Lyttle, M. D. (2015a). Are you a SCEPTIC? SoCial mEdia Precision & uTility In Conferences. *Emergency Medicine Journal*, *32*(5), 412-413.

Roland, D., May, N., Body, R., Carley, S., & Lyttle, M. D. (2015b). Will social media make or break medical conferences? *British Journal of Hospital Medicine*, *76*(6), 318-319.

Rutherford, C. (2013). Facebook as a Source of Informal Teacher Professional Development. *E in Education*, *16(*1), 60-74.

Sandars, J., & Schroter, S. (2007). Web 2.0 technologies for undergraduate and postgraduate medical education: an online survey. *Postgraduate Medical Journal*, *83*(986), 759-762.

Smith Risser, H. (2013). Virtual induction: A novice teacher's use of Twitter to form an informal mentoring network. *Teaching and Teacher Education*, *35*(1), 25-33.

Spedding, R., Jenner, R., Potier, K., Mackway-Jones, K., & Carley, S. (2013). Blended learning in paediatric emergency medicine: preliminary analysis of a virtual learning environment. *European Journal of Emergency Medicine*, *20*(2), 98-102.

Stewart, O. G. (2015). A critical review of the literature of social media's affordances in the classroom. *E-Learning and Digital Media*, *12*(5-6), 481-501.

Stornaiuolo, A., Higgs, J., & Hull G. A. (2013). Social media as authorship: Methods for studying literacies and communities online. In P. Albers, T. Holbrook, & A.S. Flint (Eds.), *New Methods of Literacy Research.* (pp. 224-237). New York, NY: Routledge.

Tess, P.A. (2013). The role of social media in higher education classes (real and virtual): A literature review. *Computers in Human Behavior*, *29*(5), A60-A68.

Timonidou, V., Zotou, M., Tambouris, E., & Tarabanis, K. (2013). A review on Facebook as a user-generated content environment in tertiary education. *International Journal of Social Media and Interactive Learning Environments*, *1*(2),164-168.

Tirado, R., Hernando, Á., & Aguaded, J. I. (2015). The effect of centralization and cohesion on the social construction of knowledge in discussion forums. *Interactive Learning Environments*, *23*(3), 293-316.

Weinstein, A. L., Saadeh, P. B., & Warren, S. M. (2011). Social networking services: Implications for the next generation of physicians. *Surgery*, *150*(1),15-16.

Wood, P. (2012). Blogs as liminal space: student teachers at the threshold. *Technology, Pedagogy and Education*, *21*(1), 85-99.

Wright, F., White, D., Hirst, T., & Cann, A. (2014). Visitors and Residents: mapping student attitudes to academic use of social networks. *Learning, Media and Technology*, *39*(1), 126-141.

Yang, Y., Wang, Q., Woo, H. L., & Quek, C. L. (2011). Using Facebook for teaching and learning: a review of the literature. *International Journal of Continuing Engineering Education and Life-Long Learning*, *21*(1), 72-86.

Yildirim, B., Basaran, O., & Alatas, O. D. (2015). Chest tube insertion techniques on YouTube: is social media a reliable source of learning medical skills? *The American Journal of Emergency Medicine*, *33*(11), 1709-1710.