



**Social Media for Professional Development and Networking Opportunities in Academia**

Journal:	<i>Journal of Further and Higher Education</i>
Manuscript ID:	CJFH-2014-0103.R1
Manuscript Type:	Original Paper
Keywords:	Social media, Twitter, Blogs, Social networking sites, Networking, STEM

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## Social Media for Professional Development and Networking Opportunities in Academia

### Abstract

*The research reported on in this paper explores the use of social media for work-related or professional purposes. In particular, it focuses on the perceptions and use of social media by academics in the UK. The purpose of the research was to explore the potential social media has to facilitate the changing landscape of higher education and support the individual academic in their role. Of particular interest is how specific social media tools are being used to enhance networking opportunities and contribute to career progression. The use of social media was explored in detail through interviews and a survey. Typical activities that are currently being undertaken were identified and user group profiles developed that articulate different levels of engagement with these tools and the motivations that each group of users have for using social media. The study found that, with increasing levels of activity, the number of motivations for using social media increase, as does the perceived number of successful outcomes, including contributions towards career progression. The main barriers to using social media were identified as a lack of time and skills to undertake these activities, as well as a negative perception towards social media. Recommendations for increasing participation are: to provide practical training, including the sharing of good practice; and to initiate dialogues within institutions regarding the potential career progression opportunities that social media may afford.*

**Keywords:** Social media, Twitter, blogs, social network sites, networking, STEM.

### Introduction

The increasing popularity and availability of social media over the past decade has attracted much attention. New research initiatives have investigated how social media are being used, from an individual's viewpoint but also how organisations might make use of a technology that has now permeated the lives of so many people. From the individual's perspective, research has explored how people are using social media to interact and engage with different communities. Of particular interest is the impact on the size and shape of an individual's social capital (Benson, Filippaiso & Morgan, 2010; Finkbeiner, 2013; Ellison, Steinfield & Lampe, 2007) and the implications for in-person or face-to-face socialising (Brandzaeg, 2012; Pollet, Roberts & Dunbar, 2011). On an organisational level, research has explored how social media may be used to engage with various stakeholders and communities (Lovejoy & Saxton, 2012; Rybalko & Seltzer, 2010; Waters, Burnett, Lamm & Lucas, 2009). Some organisations are developing and implementing social media marketing strategies. Work has also been published that develops profiles to describe different types of user, to attempt to predict user behaviour and develop appropriate marketing strategies (Foster, West & Francescucci, 2011; Ip & Wagner, 2008; Lorenzo-Romero, Alarcon-del-Amo & Constantinides, 2012).

The purpose of the research presented here is to investigate the experiences of individuals using social media within a specific work environment. The aim is to identify professional motivations for using social media and investigate whether these tools are being used to promote engagement with existing professional networks and extend the boundaries of these networks to reach broader communities. The research also explores the perceived impact of

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2  
3 these activities and whether they are creating positive career progression opportunities. The  
4 specific work context that is the focus of this research is the use of social media by UK  
5 academics in science, technology, engineering and mathematics (STEM) related disciplines.  
6 This includes professors, lecturers and researchers working within higher education  
7 institutions (HEIs). Academics working within these fields are almost certain to have had  
8 previous experience working with technology, and exposure to some form of computer-  
9 mediated communication in their roles. It is therefore logical to expect that the use of social  
10 media will have already filtered into some working practices.  
11

12  
13 The research begins with a small scale exploratory study focussing on the use of social media  
14 at the UK Open University (UK OU). The UK OU is the largest provider of distance  
15 education in the UK and computer-mediated communication is central to teaching and  
16 research activities. A range of electronic communication tools, including various forms of  
17 social media, are used to support learning and teaching activities and collaborative research  
18 projects. As such, some academics within the UK OU have been using social media tools for  
19 quite some time. The research then moves on to conduct a larger scale exploration of  
20 emerging themes and patterns of activity with a more substantial sample set at other HEIs.  
21  
22

## 23 **Background**

### 24 **The changing academic environment**

25 This paper explores how social media tools are being used to support some of aspects of the  
26 academic role. The changing nature of the academic role has attracted attention in recent  
27 years. Increasing commercial interests within higher education and the effects this is having  
28 on the individual academic are leading to complex professional identities with a shift towards  
29 alignment with corporate culture (Billot, 2010; Winter, 2009). The new university fee  
30 structures introduced in the UK have sparked debates about students taking on the role of  
31 customer (Garner, 2012) and HEIs having to adapt their marketing strategies and compete for  
32 student registrations. As a part of an academic's research activities, increasing public  
33 engagement seems central to the changing nature of the individual academic role. Academic  
34 researchers are expected to engage with wider user communities and, where possible, connect  
35 with the public (Lispett, 2010). Implications are that the academic role is something that can  
36 no longer only be nurtured within specialist academic groups and subscription based journals  
37 (Freedman & Anyangwe, 2012). Research activities that have an impact on a HEI's wider  
38 strategies and that attract attention, and therefore funding, from new spheres are encouraged.  
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### 42 **Social media in academia**

43 Information and communication technologies (ICTs) have transformed professional and  
44 work-place activity. They have affected how people communicate, collaborate, and find and  
45 share information. Over the past decade, the social influences of Web 2.0 and the huge  
46 increase in social media tools that are freely available have transformed these activities yet  
47 again. In this research, the term 'social media tool' includes blogs, Twitter, social networking  
48 sites (such as Facebook and professional based sites such as LinkedIn), media sharing sites  
49 (such as YouTube, Flickr and SlideShare) and social bookmarking sites (such as Delicious).  
50  
51

52 From a higher education perspective, exploiting the fact that many of these tools have already  
53 permeated students' lives outside of their studies, some of these tools have been incorporated  
54 into both formal and informal learning activities (Donlan, 2014; Kear, Donelan & Williams,  
55 2014; Selwyn, 2009; Tess, 2013). From a career development view-point, and still making  
56 use of graduates' fluency with these tools, an abundance of resources are available that offer  
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3 advice on activities such as: finding jobs through social networking; managing an online  
4 reputation; and self-marketing techniques. Social media offers a low-cost platform for  
5 building and communicating a professional identity or '*personal brand, communicating who*  
6 *you are both within and outside your company*' (Dutta, 2010).  
7

8  
9 The research presented in this paper focuses on the perceptions of today's academics of how  
10 these tools fit in with the academic role. With the number of academic authored blogs that are  
11 now available, and an increasing presence on Twitter, the evidence suggests that some  
12 academics are embracing the use of these tools as avenues for increasing public engagement  
13 and for creating an online professional presence. Recent discussions on digital scholarship  
14 (Pearce, 2010; Weller, 2010) and open access publishing (Freedman & Anyangwe, 2012)  
15 also imply that social media may be becoming an important mechanism in the dissemination  
16 of research (Osterrieder, 2012; Roscorla, 2012). Blogs are being used to circulate early  
17 research findings and invite comment on early drafts of books (Weller, 2010). Twitter offers  
18 a space that can be used to publicise links to blogs or 'follow' peers in order to keep up with  
19 what others in similar fields are doing. 'Professional' social networking sites such as  
20 LinkedIn and Academia.edu offer opportunities to build professional networks and create an  
21 online professional profile.  
22

23  
24 So the tools are available and initial evidence has shown that academics are interested in  
25 using social media for enhancing their professional reputation and interacting with wider  
26 communities to generate increased interest in their work (Knight & Kaye, 2014). The  
27 research presented here sought evidence of these activities and investigated the perceived  
28 impact they are having on networking, wider engagement and ultimately career progression  
29 opportunities. It asks whether academics are adapting their ways of working, publishing,  
30 networking and engaging to make use of these new methods and tools, and if so whether  
31 there are measurable outcomes with respect to professional development.  
32

### 33 34 **Social media research**

35 Published work that examines the use of social media spans many disciplines including  
36 computer science, in particular computer-mediated communication (e.g. Brandtzaeg, 2012;  
37 Lovejoy & Saxton, 2012), social behaviour and psychology (e.g. Pollet et al., 2011; Lorenzo-  
38 Romero et al., 2012) and business, management and marketing (e.g. Finkeiner, 2012; Foster  
39 et al., 2011). One way of dealing with data that describes how people use technology is using  
40 segmentation – a marketing strategy that aims to divide users into groups based on common  
41 needs, in order to develop targeted marketing strategies. This 'Social technographics' is a  
42 market research tool that classifies social media users according to their level of participation  
43 and is used by companies to set their social media agendas (Li, 2007; Zhang, 2010). Foster et  
44 al. (2011) provide a useful summary of the published work on social media segmentation  
45 which provides various frameworks and spans various disciplines including Brand  
46 Management (Marketing), Computer Science and Sociology. Of particular note to this  
47 research is the work carried out by Ip & Wagner (2008) that studied weblogging (or  
48 blogging) activity. Through a series of 33 interviews with bloggers the researchers developed  
49 four categories of user, based on their usage intensity. In increasing order of usage, from  
50 rarely to several times a day, these four categories were: Lurkers, Personal, Active and  
51 Habitual. Similarly, more recent work situated within the Social Behaviour literature  
52 (Lorenzo-Romero et al., 2012) developed different social networking site user groups by  
53 looking at the frequency of different activities, sociodemographic variables, social  
54 networking experience and patterns of interaction. They defined three user groups: Introvert,  
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3 Versatile, and Expert communicator. Table 1 provides a brief summary of the activities of  
4 these three user groups.  
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7 **Table 1: A summary of social networking site user groups (Lorenzo-Romero et al.,**  
8 **2012)**  
9

10 The above profiles were developed based on data describing participants' use of the internet  
11 and social networking sites in general. Activities that have a professional purpose were not  
12 the focus. The findings of the research presented in this paper extend on the user groups  
13 developed by Lorenzo-Romero et al. (2012) and add to the original profiles by considering  
14 how the different levels of participation in work-related activities may be classified.  
15 Activities are associated with the original definitions to enable different levels of professional  
16 or work-related usage to be identified. The research also includes other forms of social media,  
17 such as Twitter and blogs, as well as use of social networking sites.  
18

19  
20 Whilst the different groups are easily identified by their activities and patterns of interaction,  
21 an interesting aspect that also identifies them are different motivations for using social  
22 networking sites. For example, in the original research (Lorenzo-Romero et al., 2012) the  
23 only motivation identified for Introvert users was that they had been invited by others,  
24 whereas users in the other two groups tended to exhibit other, more self-driven motivations.  
25 For example, Versatile users cited maintaining contact with friends or entertainment as  
26 additional motivations. Expert communicators gave a wide range of possible motivations  
27 including: to make new friends, for the novelty, professional interests, establishing  
28 relationships, to keep informed about events and to develop existing relationships.  
29

30  
31 The research presented here focuses not only on the activities being undertaken but the  
32 motivations that academics have for engaging with these tools. It then goes onto examine the  
33 perceived outcomes. This is an important dimension to the research, particularly as the  
34 motivations and outcomes are professionally orientated and should align with the academic  
35 role and demands regarding networking and engagement.  
36

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38 **Research objectives**

39 This research provides a timely exploration into how STEM academics are using social  
40 media. It extends recent work on social media user group profiles to include use of these tools  
41 from a work-orientated viewpoint. The main research questions addressed are:

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- How are STEM academics currently using social media in their working practices?
  - What are the motivations for, and perceived outcomes of, using social media within a professional context?
  - What are the barriers that are preventing STEM academics from using social media in their working practices, and what recommendations can be made to support them?

49  
50 **Method**

51 The research takes a mixed-methods approach, using interviews and an online survey. A  
52 mixed-methods approach is described by Creswell (2003) as combining the use of qualitative  
53 and quantitative methods. One mixed-method approach is to start with a general exploration  
54 to elicit the key variables involved and then go on to explore these variables with a large  
55 sample (Creswell, 2003, p. 22). For example, a study might use a small number of  
56 exploratory interviews to identify the key issues, followed by a larger scale survey to assess  
57 the significance of these issues. This method suits the current study well so the research was  
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3 carried out in two phases. The first phase took a qualitative approach, and was a small scale  
4 exploratory study. This was used to identify the key themes and to begin to identify a range  
5 of activities of STEM academics already using social media. The second phase of the study  
6 aimed to explore these emerging themes and patterns with a more substantial sample set, and  
7 used an online survey to encourage a wide range and large number of responses.  
8

9  
10 Table 2 provides a summary of: the time periods for data collection; sample sizes; methods;  
11 and approaches used in the two phases of the research. Each phase is then described in more  
12 detail, in terms of approaches and objectives, in the rest of this section. The results of both  
13 phases are then discussed in the next section.  
14

## 15 **Table 2: Phases of the project**

### 16 *Phase 1: Interviews*

17 A small number of semi-structured, face-to-face interviews were used in the first phase.  
18 These enabled predetermined topics to be discussed and yet allowed unexpected responses to  
19 be explored in more detail as they arose (Anderson & Kanuka, 2003). The main aims of the  
20 interviews were:  
21

- 22 • to gain an insight into the perceptions and experiences of academics that are currently  
23 using social media in some form;
- 24 • to start to develop user group profiles based on work-related activities.  
25  
26

27 The interview participants needed to have a work-related social media presence. Therefore,  
28 potential participants for this phase of the project were either blogging on a regular basis  
29 (about work related subjects) and/or posting work related updates and connecting to (amongst  
30 others) work related connections via Twitter or social networking sites.  
31  
32

33 Potential participants who were employed as academic or academic-related members of staff  
34 within STEM departments at the UK Open University (UK OU) were identified. The UK OU  
35 was where the research project was being carried out and therefore direct access for face-to-  
36 face interviews was available. In order to identify potential participants, personal website  
37 profiles of UK OU academic staff within STEM disciplines were studied to find links to  
38 blogs or Twitter usernames. Additionally, the search functionality was used to find UK OU  
39 STEM academics with a presence on Twitter. From the results of these investigations a pool  
40 of potential participants was identified. Invitations to participate in the study were sent to 6  
41 people via e-mail. This number was chosen as it allowed a range of disciplines across STEM,  
42 and a variety of different social media related activities, to be included. Keeping the number  
43 small ensured that in-depth discussions could be held with each participant and the  
44 subsequent analysis of the interview data was thorough and detailed but could be carried out  
45 within the time constraints of the project. From these initial invitations 5 people agreed to be  
46 interviewed. It was felt that this number was sufficient to cover the different areas identified  
47 above.  
48  
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50 Although the sample set for Phase 1 was potentially biased, as all participants were from the  
51 same HEI, Phase 2 extended the research beyond the UK OU to STEM academics at other  
52 UK HEIs.  
53  
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55 The 5 interviews were conducted over a period of a month (May/June 2012). All interviews  
56 were recorded, with the permission of the participants, and then transcribed to assist in the  
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analysis. Each interview lasted between 15 and 30 minutes and used open ended questions that guided discussions around four general areas of interest:

- Activities – what were they doing;
- Motivations – why were they doing it;
- Outcomes – what benefits, or otherwise, did they feel they were getting out of it.

### ***Phase 2: Online survey***

The second phase of the study aimed to collect both qualitative and quantitative data from a substantial sample set through a survey. The research was extended to other UK HEIs to examine patterns of engagement amongst UK academics more generally. In addition, those who did not use social media for work-related purposes were also invited to participate in the research. The main aims of the survey were:

- To further investigate and validate patterns and themes emerging from Phase 1
- To investigate differences between the different social media tools
- To investigate the barriers for those not using social media

An online survey was used, as this offers a range of advantages over paper or telephone surveys, including reduced cost and time and higher response rates (Anderson & Kanuka, 2003). The survey was tested at several stages in order to avoid the various errors that can occur in online surveys (Anderson & Kanuka, 2003). There are numerous online survey tools available, offering similar services, and [www.surveymonkey.com](http://www.surveymonkey.com) was used in this instance.

Invitations to participate in the survey were distributed via the following email distribution lists: [news@mail.heacademy.ac.uk](mailto:news@mail.heacademy.ac.uk), the Higher Education Academy's (HEA) newsletter; [nccpe-pen@jiscmail.ac.uk](mailto:nccpe-pen@jiscmail.ac.uk), a mailing list for those interested in public engagement in HEIs ; [psci-com@jiscmail.ac.uk](mailto:psci-com@jiscmail.ac.uk), a mailing list for those interested in the public communication of science and public engagement with science. Some of these generated more interest and therefore responses, than others. In addition, some academics that received the initial invite from one of these lists forwarded the invite via email to colleagues at their HEI. The invitation was also 'tweeted' and then 'retweeted' four times via Twitter.

Responses were received from academics at a wide range of UK based universities, including: Bath, Bournemouth, Brunel, Cardiff, Dundee, Durham, Huddersfield, Manchester Metropolitan, Edinburgh Napier, Newcastle, Plymouth, Salford, Sheffield and Southampton.

## **Results**

### ***Phase 1: Interviews***

Comments received from interview participants that described their social media activities were studied in detail and it was found that these mapped relatively easily onto the original activities identified by Lorenzo-Romero et al (2012). For example, interview participants described activities in terms of whether they were communicating with specific groups of people (existing contacts or new contacts) and whether they were using private (one to one) messaging facilities, public (one to many) messaging facilities or a combination of both. These activities are applicable to both personal and work-related use of social media.

Comments relating to activities were used to extend the original user group profiles to include work-related activities and these activities are summarised in Table 3. The activities described in Table 3 and the original descriptions summarised in Table 1 were used to

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3 position each of the interview participants in one of the user groups. For example, a  
4 participant that described daily use of more than one social media tool, large numbers of  
5 followers, and that was regularly posting and commenting online, would be considered an  
6 Expert communicator. Of the 5 interview participants, 2 were considered Versatile users and  
7 3 were considered Expert communicators.  
8

9  
10 **Table 3: Activities of Versatile users and Expert communicators identified through**  
11 **interviews**

12  
13 The Versatile users displayed a combination of passive and proactive approaches to their use  
14 of social media. They regularly used social media tools but tended to read/observe/view more  
15 frequently than they would write/comment/post.  
16

17  
18 All 5 participants had some contact with work-related social networking sites (SNS) – the  
19 most commonly mentioned being LinkedIn and Academia.edu. The level of activity on these  
20 varied but, for most participants was limited to viewing approximately once a week and  
21 updating profiles less frequently.  
22

23  
24 All interview participants except one Versatile user were blogging. The Versatile user who  
25 was blogging, regularly updated a project blog with the specific aim to keep various  
26 communities up to date with the project progress. The Expert communicators contributed to  
27 multiple blogs. These included work-related blogs where they were the sole contributor as  
28 well as project blogs that typically had multiple contributors.  
29

30  
31 All interview participants except one Versatile user were using Twitter. The other Versatile  
32 user was using Twitter, but had a casual attitude towards it.

33  
34 *I am not, you know, doing it as a big deal I suppose or making a huge effort -*  
35 *certainly not doing anything everyday [...] I think that's quite good to have that out*  
36 *there as a, you know, [a] visible face.*

37  
38 Where the Versatile users described periods of either regular blog posting or tweeting, this  
39 was usually initiated due to project updates or attendance at an event – i.e. these periods of  
40 activity were inspired by an external event rather than it being something that was maintained  
41 long term.  
42

43  
44 *So for instance if I'm at a conference I'll tweet. I don't use it very often but it tends to*  
45 *go in bursts.*

46  
47 The Expert communicators were more consistent in their use of Twitter, with phrases such as  
48 'constantly on in the background' or 'daily conversational space' used to describe their  
49 attitudes towards it.  
50

51  
52 *[...] certainly have my Twitter feed going on in the background and I might look at it*  
53 *several times a day just to see if there is anything interesting going on.*

54  
55 As well as having multiple blogs, the Expert communicators maintained a wide portfolio of  
56 tools, especially in the form of online environments that were focused around resource  
57 sharing. They often proactively searched for new tools that enabled them to share different  
58 kinds of content (presentations, videos etc.) and mentioned: social bookmarking services such  
59  
60



as Delicious; slide sharing sites such as SlideShare; CloudWorks (a UK OU social networking site for sharing learning and teaching ideas); and RefWorks – an ‘*online research management writing and collaboration tool*’ (Refworks, n.d.).

Motivations for using social media were also discussed in interviews. Four key themes emerged concerning motivations:

- Externally driven: invited by colleagues or a project or institutional demand.
- Self-development: such as information acquiring or keeping up to date.
- Maintaining networks: maintaining or strengthening existing connections.
- Widening networks: making new contacts or increasing engagement opportunities.

Table 4 provides a summary of the motivations that emerged from the interviews.

**Table 4: Motivations of Versatile users and Expert communicators identified through interviews**

Of the four themes surrounding motivations that were identified, Expert communicators did not talk about any externally driven motivators. That is, they were not invited by others or having to use something due to the demands of a project or institution. When it came to ‘networking’ motivations, comments from the Expert communicators suggested they were more likely to take a strategic approach. They tended to give more examples of how they used social media to widen networks and were particularly interested in contacts that they considered useful. One said he would ‘*only follow people ranked above me*’ another talked about the people he followed as a community of people whose main communication method was via Twitter. The Versatile user who used Twitter talked primarily about self-development motivations and how Twitter provided access to regular updates and information in his field. He mentioned several international or major organisations and agencies that he followed. Although he also talked about individuals that he followed and knew personally, Twitter was not his main channel for communication with these people.

Expert communicators placed high priority on the online content they generated such as blog posts or the comments they made on online public documents and felt this was integral to their academic work.

*...occasionally things come back through the press or people talk to people [...]. They are aware of what I am doing through my public presence.*

‘Ego’ was also mentioned by two Expert communicators as part of what motivated them.

*I am kind of conscious of that in some respects, you know, what you are writing, I suppose, is for an audience as well and its also partly, you know, arrogance or ego at the same time - there is no doubt about that.*

Despite being avid Twitter users, they also tended to exhibit either a dislike of, or indifference towards Facebook.

*I do have a Facebook account, absolutely detest Facebook... but I am also conscious of the fact that, you know, it’s still an extremely [...] dispersed medium and, you know, I need to find a way of me engaging with it better, if that makes sense, because the audience, you know, is actually very large.*

1  
2  
3  
4 *Facebook is a bit different because Facebook is largely these days just another*  
5 *repository for my Twitter feed.*  
6

### 7 **Phase 2: Online survey**

8 Although other tools were mentioned, blogs, Twitter and SNS, such as LinkedIn and  
9 Academia.edu, were the main focus of discussions in Phase 1 and therefore Phase 2 also  
10 focused on these tools. The activities, motivations and outcomes that were discussed in the  
11 Phase 1 interviews were used to formulate the survey questions and options provided. Blank  
12 text boxes were also provided, to encourage elaboration on answers. Space was provided that  
13 enabled those not using social media to give their reasons why.  
14

15  
16 127 survey responses were received. Of these, 12 were incomplete and are not used in the  
17 analysis presented. The responses of the remaining 115 participants were studied in detail to  
18 obtain an overall picture of each individual's use of social media. The responses were  
19 examined for the survey questions that asked about the tools used how they were used, for  
20 example: frequency of use; how often they read and/or posted; and the number of contacts  
21 they maintained for each social media tool. These responses, and the information from Tables  
22 1 and 3 illustrated earlier, enabled survey participants to be placed within the different user  
23 groups. It also enabled the identification of activities and motivations that paralleled those  
24 that described the Introvert users originally defined by Lorenzo-Romero et al. (2012). The  
25 activities and motivations identified for Introvert users from the survey responses are  
26 summarised in Tables 5 and 6 respectively.  
27  
28

### 29 **Table 5: Activities of Introvert users identified through the survey**

### 30 **Table 6: Motivations of Introvert users identified through the survey**

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33  
34 Early in the process of examining survey participants responses it became apparent that a  
35 fourth user group 'Non-adopters' was also needed. This group represented those individuals  
36 who indicated they did not use any of the social media types identified in the survey  
37 questions.  
38

39 The percentage of survey participants within each of the 4 user groups are given in Table 7.  
40

### 41 **Table 7: Percentage of survey participants in each user group**

42  
43  
44 Table 8 gives the percentages of survey participants using each of the social media tools that  
45 were explored through the survey. In the cases of Twitter and SNS an additional number of  
46 participants said they used these tools but only for social (non-work related) purposes.  
47

### 48 **Table 8: Percentage of survey participants using each social media tool**

### 49 **Outcomes of using social media**

50  
51 Several of the survey questions explored the outcomes that survey participants had  
52 experienced through using social media. These questions provided a list of options, and  
53 participants were able to select as many of these as they felt applicable, for each social media  
54 tool they used. The options provided are illustrated in Table 9. Each of the options is  
55 associated with one of the themes relating to motivations identified earlier and the results are  
56 discussed below within the context of these themes.  
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**Table 9: Options describing outcomes of using social media***Self-development*

The use of Twitter by Introvert users was low however most of the Versatile users and Expert communicators were using it.

70% of those using Twitter felt they had learnt something new that had contributed to their work (compared to 51% of those that were blogging and 33% of SNS users). Only 50% of Versatile users that said that they were aiming to use Twitter to keep up to date indicated that this had actually happened compared to 80% of Expert communicators.

The option '*Contributed to my career progression*' received the lowest number of selections for each of the 3 social media tools (11% of SNS users, 16% of Twitter users and 30% of bloggers). However, looking at the responses by user group there is an interesting difference. None of the Introvert users, and only a small number of Versatile users, felt that using any form of social media had had any impact on their career progression. This was compared to half of the Expert communicators, who chose this option for at least one of the tools they were using. For those who did feel it had made some impact, open comments were invited to encourage examples to illustrate how. The most frequent comments (most noticeably with respect to Twitter, but comments were also received with respect to the others) was that being able to use social media successfully was now seen as a skill that employers want.

*I have managed Twitter accounts for the department where I work, and special interest groups that I'm involved in. These are skills that people have expressed an interest in.*

*The ability to use twitter is a skill which many employers are looking for now.*

Another theme that emerged with respect to career progression was that of increased visibility and public profile.

*Senior people know who I am because of Twitter. That has to help.*

*Prizes for public outreach, higher public profile, journalist contacts, name recognition.*

This provides an interesting insight into how users of these tools perceive their usefulness from a career progression point of view.

*Maintaining networks*

Most participants who were using SNS indicated that they were using these with the aim to keep in contact with existing networks. 71% of SNS users felt that SNS had actually helped them maintain existing networks (47% Twitter; 38% blogs). However, only 53% said that SNS had helped them *strengthen* existing networks, with Twitter being slightly more successful at this (60% Twitter; 41% blogs).

*Widening networks*

With respect to widening networks, two of the options provided were significant – '*Developed new networks/contacts*' and '*Extended the audience of my work*'. Less than half

of those using SNS felt that these had enabled them to make new contacts or reach new audiences. Blogs were, unsurprisingly, the most successful tool for extending the audience of participants' work, with 76% of those who were blogging selecting this option (66% Twitter; 47% SNS). However, only 51% of bloggers felt that these activities had helped them develop new contacts, compared to 66% of Twitter users (43% SNS).

Participants who selected at least one of the options that related to widening networks were given the opportunity to expand on this through an open comments box. This asked them to elaborate on who they felt the new contacts/audiences were. There was a wide variation in the groups, communities and individuals mentioned. This is illustrated in the word cloud in Figure 1.

### **Figure 1: New contacts through social media**

Academic networks were mentioned most frequently, both within and outside individuals' discipline areas. Journalists, the 'interested' public and teachers were also mentioned frequently. The only specific discipline areas mentioned were Environment and Health.

#### ***Barriers***

The survey included questions to investigate what was preventing some participants from engaging in activities via social media. Participants who indicated they did not use each type of social media tool were asked to give their reasons via open text boxes. A total of 111 comments were received, 33 referring to Twitter, 31 to SNS and 47 to blogs.

A wide variety of responses were received to this question and comments were categorised under 6 main themes.

- Negative perceptions of social media.
- Not having the time to use social media or not seeing it as an efficient use of time.
- A lack of knowledge or skills about how to use the tools.
- A lack of confidence in generating the content to be communicated via social media
- No interest in using social media tools for work-related purposes.
- Concerns around safety and privacy.

The proportion of comments that fell within each of these themes is illustrated in Figure 2.

### **Figure 2: Barriers to using social media**

As Figure 2 illustrates, the largest number of comments overall related to lack of time to use social media for work related purposes. Most of these comments, however, referred to blogs. 55% of comments that related to blogs were about a lack of time to blog, compared to 26% of the comments relating to SNS and 15% of the comments relating to Twitter.

The second largest barrier was simply not having an interest in using social media for work-related purposes. Here, the biggest contributor was SNS with 41% of SNS comments related to lack of interest, compared to 27% for Twitter and 6% for blogs.

The third largest barrier was negative perceptions of social media, with around 19% of comments. Here, Twitter had the highest proportion of comments with 27%, compared to

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3 SNS with 19% and blogs with 13%. Comments included terms such as ‘superficial’, ‘inane’,  
4 ‘unproductive’ and ‘celebrity led’.  
5

6 The fourth main barrier was participants not knowing *how* to use social media, or a particular  
7 form of social media, for work-related purposes. The number of comments was higher for  
8 Twitter (21%) and blogs (19%) than for SNS (3%). More people were confident about how  
9 SNS could be used, but they had simply chosen not to use them for work-related purposes.  
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11 A few comments were also received that expressed a lack of confidence with generating the  
12 content to be published online and in public view, and also concerns around safety and  
13 privacy.  
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15  
16 Bearing the above breakdown of results in mind, the most significant barriers for each of the  
17 individual tools are quite different, as illustrated in Figure 3.  
18

### 19 **Figure 3: Barriers to using Twitter, SNS and Blogs**

## 20 **Discussion**

21 The following discussion is structured around the research questions outlined earlier.

### 22 ***How are STEM academics currently using social media in their working practices?***

23 This research enabled a substantial development of ideas around the user group profiles  
24 originally identified by Lorenzo-Romero et al. (2012): Introvert users; Versatile users; and  
25 Expert communicators. An additional group, Non-adopters, was also identified. Different  
26 levels of engagement with social media mapped onto these user group profiles and illustrated  
27 the range of current practices of STEM academics.  
28

29 Some academics have fully integrated social media into all aspects of work routines,  
30 sometimes using it as a main communication medium rather than email. Ip & Wagner (2008),  
31 in their research into blogging activities, used the words ‘less addicted’ to differentiate  
32 between the two groups of user they called Active and Habitual - who were the most  
33 enthusiastic users. A degree of ‘addiction’ was seen in some examples in the research  
34 presented here. One interview participant said that he had been ‘weaning’ himself off Twitter  
35 as he felt he used it too much. Another described how he was continually looking for new  
36 tools and methods to share content. For these academics, Twitter was central to everyday  
37 communications – particularly within niche academic networks – and was ‘*constantly on in*  
38 *the background*’. One major differentiating factor of these participants was that they did not  
39 describe their use of social media as an additional task, rather it had replaced other more  
40 traditional communication channels. Examples were identified where social media was  
41 embedded within working practices and was being used on a daily basis to find information,  
42 record thoughts and outputs, and strategically network.  
43

44 The majority of academics that took part in this research were using some form social media  
45 within their work practices but to a lesser extent than described above. Social media was not  
46 integrated into all daily routines and was not generally a primary channel of communication,  
47 more an additional one. In this way, using social media appeared to be an extra task. These  
48 ‘Versatile users’ generally used more than one social media tool and it was often observed  
49 that social media was used more intensely around certain events. The term ‘Versatile’ implies  
50 that these are adaptable users, which in some respects is accurate, but what this does not  
51 impart is the intermittent use that was observed in this research. This behaviour was not  
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3 characterised by any of the user groups defined by Lorenzo-Romero et al. (2012) or Ip &  
4 Wagner (2007) and may be a product of the work-related context within which this research  
5 took place.  
6

7  
8 ***What are the motivations for, and perceived outcomes of, using social media within a***  
9 ***professional context?***

10 Four main themes that describe different motivations for using social media emerged from  
11 the data: Externally driven; self-development; maintaining networks; and widening networks.  
12

13 Substantial differences were observed not only in the activities but also the motivations and  
14 outcomes described by participants. Moving from Introvert, to Versatile, to Expert, it is  
15 obvious that the number of activities observed will increase. It was also observed that the  
16 number of motivations increased as well as the number of perceived outcomes – i.e. how  
17 successfully these motivations were being realised. The implication from the results is that  
18 undertaking the additional activities that have been described for Expert communicators is  
19 likely to result in a greater number of positive outcomes, including career progression.  
20

21  
22 Different approaches were observed with respect to widening networks. Examples of  
23 widening networks through the use of Twitter were varied. Some participants were interested  
24 in following either individuals or organisations that would provide useful updates or  
25 information, whereas others talked about strategic networking practices, using social media to  
26 associate themselves with contemporaries that were perceived as useful or ranked more  
27 highly. A small number of examples were found where the use of social media was focused  
28 on engaging with the public. These were in fields where there was already a public interest,  
29 such as the environment and health.  
30

31  
32 ***What are the barriers that are preventing STEM academics from using social media in***  
33 ***their working practices, and what recommendations can be made to support them?***

34 Approximately one third of participants in this research were not using social media much, if  
35 at all. Past research has identified two main categories of barrier to the adoption of new  
36 technology: functional and psychological (Ram & Sheth, 1989; Tu & Poston, 2012).  
37 Functional barriers include situations when the technology is not compatible with users'  
38 existing routines or where users are daunted by, amongst other things, the uncertain benefits  
39 of using the new technology (Tu & Poston, 2012). Some of the barriers identified in the  
40 research presented here, such as a perceived lack of skills or time, or not having an interest in  
41 using social media for work-related purposes, are functional barriers. Increasing the  
42 perceived usability, that is how easy a technology is to use, and its perceived usefulness, are  
43 ways to overcome functional barriers (Davis, 1989; Tu & Poston, 2012). These barriers could  
44 most readily be addressed through training or workshops providing, for example: practical  
45 guidance on using social media within an academic environment; examples of successful  
46 practice; and guidance on writing for specific online environments.  
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50 Psychological barriers include a technology being viewed negatively. This was one of the  
51 main barriers identified in the present research and may not be as easily solved through  
52 training. Other measures may be needed to convince sceptics of the potential benefits of  
53 social media in the work-place, and more specifically the academic workplace. Initiating  
54 dialogues, both with academics who feel they are using social media to successfully support  
55 their academic role, but also with management to clarify any institutional policies, may begin  
56 to address these barriers. An important aspect of these dialogues is to identify measurable  
57 outcomes from an individual's career progression point of view.  
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4 Interestingly, very few responses received in this research indicated a lack of confidence in  
5 generating online content. This may be because the majority of data collected here was  
6 describing barriers faced by Non-adopters and Introvert users. Issues surrounding negative  
7 perceptions and a lack of skills may be the first barriers encountered by someone  
8 contemplating using social media for work-related purposes. Lack of confidence in  
9 generating the actual content may be something experienced at a later stage once the initial  
10 hurdles have been overcome. An interesting follow up to this research would be to explore  
11 whether lack of confidence is a bigger barrier to Versatile users who are trying, but  
12 struggling, to increase their level of participation. It is possible that Versatile users may have  
13 overcome any negative perceptions, and to some extent the skills gap, of Introvert users, and  
14 therefore will be confronted by a different set of barriers.  
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16  
17 In summary, this research has highlighted how social media tools are currently being used to  
18 support some aspects of the STEM academic role. Examples have been highlighted that  
19 show how social media are extending networks and fulfilling the needs of some academics.  
20 However, only 50% of those surveyed that currently have high levels of engagement with  
21 social media felt that these activities had some positive influence on their own career  
22 progression. Social media are not currently viewed by all STEM academics as an essential, or  
23 in fact necessary, tool for carrying out their daily tasks.  
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### 26 *Limitations of the research*

27 The findings were limited by the sample set used. In the first phase of the study, interviews  
28 were limited to academics at the UK OU where the culture of a distance learning  
29 environment will have some effect on the use of ICTs and therefore social media.  
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32 In the second phase of the study, the survey participants were self-selected. Survey responses  
33 were invited from STEM academics whether they were or were not using social media,  
34 although due to the nature of the mailing lists and networks utilised there is likely to be bias  
35 towards those that have had some exposure to social media. In addition, one of the mailing  
36 lists used was science based, and although it is unknown exactly what percentage of  
37 responses this mailing list generated, there were a proportionally higher number of  
38 respondents working in science related disciplines, which may be attributed this.  
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41 These limitations mean that the results are not completely transferable. The patterns of  
42 activity and motivations identified, and the user groups developed, may be useful for future  
43 studies interested in the use of social media, particularly in an academic environment. Some  
44 of the more context specific results may not transfer as readily. In particular, the proportions  
45 of people observed within each user group, in both phases of the project, are heavily  
46 influenced by the sample sets used.  
47

### 48 **CONCLUSION**

49 This paper identifies: approaches to social media that STEM academics are adopting; the  
50 different motivations for using social media; and the outcomes that they are experiencing in  
51 their professional lives. Motivations are varied and differ across the different types of social  
52 media investigated (Twitter, social networking sites and blogs). Social media user group  
53 profiles that have previously been developed have been extended by this research to include  
54 work-related activities and motivations. The differences between these groups were  
55 examined.  
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3 The data suggests that academics who engage more frequently, with a higher number of  
4 social media tools, tend also to have a wider range of motivations for using them, and  
5 experience a greater number of successful outcomes. Half of those surveyed, who had  
6 integrated social media activities into their daily work routines, felt that they had experienced  
7 some positive contribution to their career progression as a result. These users were driven  
8 mostly by motivations related to self-development and widening networks. They employed  
9 tools that facilitate and promote the sharing of content and felt that this was important to their  
10 academic role.  
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12  
13 Barriers to participation were also identified. The biggest barriers to those currently not  
14 engaging with any great significance are negative perceptions of social media and lack of  
15 time, interest or skills.  
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18 If the use of social media is to be encouraged in academia, practical training is needed, as are  
19 dialogues with institutional management to understand the potential benefits and career  
20 progression opportunities these activities bring.  
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User group	Activities
Introvert users	Send private messages, contact friends. Less frequently they update their profiles. Typically use less than once a week for less than an hour.
Versatile users	Update their profile, share photos, send private messages and search for friends. Less frequently they might look for information and send public messages. Typically use several times a week for over an hour per week.
Expert communicators	They do all the above activities but more frequently. They may also share ideas/reflections, make comments on other users' profiles/photos, send public messages, examine other users' profiles and inform others about products etc. Typically use more than once a day for over an hour per week.

**Table 1: A summary of social networking site user groups (Lorenzo-Romero et al., 2012)**

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	<b>Phase 1</b>	<b>Phase 2</b>
<b>Date undertaken</b>	May/June 2012	March/April 2013
<b>Sample size/responses</b>	5	127
<b>Method of data collection</b>	Face-to-face interviews	Online survey
<b>Approach</b>	Qualitative	Qualitative and quantitative

**Table 2: Phases of the project**

For Peer Review Only

User group	Work-related /professional activities
Versatile users	<ul style="list-style-type: none"> <li>• Engage regularly with one or more social media tools.</li> <li>• May be blogging fairly regularly.</li> <li>• May be using Twitter; tend to log on fairly regularly (several times a week); read more than post although may post more frequently around specific events (e.g. conferences); typically ‘follow’ more than are ‘followed’.</li> <li>• Typically a member of at least one professional based SNS (e.g. LinkedIn, Academia.edu) and log on at least weekly. Activities may include: viewing others’ profiles; message or search for existing contacts; update profile; read relevant discussions.</li> </ul>
Expert communicators	<ul style="list-style-type: none"> <li>• Use a minimum of 2 different social media tools and typically engage with at least one tool several times a day.</li> <li>• May have several blogs, although the frequency of posts may vary.</li> <li>• Tend to use Twitter very frequently; have a large contact base; are typically followed by more people than they follow.</li> <li>• May use different tools to support different networks.</li> <li>• Typically share ideas/reflections online and make content publicly available through some form of social media, and welcome comments and feedback.</li> <li>• May use profession based SNSs but tend to use them less frequently than the tools facilitating content sharing/commenting.</li> </ul>

**Table 3: Activities of Versatile users and Expert communicators identified through interviews**

User group	Motivations
Versatile users	<ul style="list-style-type: none"> <li>• <i>Externally driven</i>: either invited by colleagues or know of others that are using a particular social media tool; there may also be a project or institutional requirement.</li> <li>• <i>Self-development</i>: Keeping up to date and using social media as a reliable information source.</li> <li>• <i>Maintaining networks</i>: Using social media to keep in touch with and strengthen (mostly academic) existing networks; to disseminate research work to specific communities</li> <li>• <i>Widening networks</i>: using social media to bring the work of an institution to a wider audience;</li> </ul>
Expert communicators	<ul style="list-style-type: none"> <li>• <i>Self-development</i>: Keeping up to date and using social media as a reliable information source; using blogs to maintain an online notebook (for personal reference and feedback); as an ego boost</li> <li>• <i>Maintaining networks</i>: Using social media to keep in touch with and strengthen existing networks; to disseminate research work to specific communities; to maintain wider, sometimes non-academic, professional networks</li> <li>• <i>Widening networks</i>: using social media to bring the work of an institution to a wider audience; strategic networking; to encourage public content and comments; using blogs to maintain an online notebook (for informing others)</li> </ul>

**Table 4: Motivations of Versatile users and Expert communicators identified through interviews**

User group	Work-related /professional activities
Introvert users	<ul style="list-style-type: none"><li>• May use one or two social media tools, infrequently.</li><li>• May blog very infrequently or log on to Twitter, but to read rather than post. Typically 'follow' more than are 'followed'.</li><li>• May be a member of a profession based SNS (e.g. LinkedIn, Academia.edu) but typically log on less than once a week and mainly to view others' profiles.</li></ul>

**Table 5: Activities of Introvert users identified through the survey**

For Peer Review Only



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User group	Motivations
Introvert users	<ul style="list-style-type: none"> <li data-bbox="552 252 1299 357">• <i>Externally driven</i>: either invited by colleagues or know of others who are using a tool. There may also be a project or institutional requirement.</li> </ul>

**Table 6: Motivations of Introvert users identified through the survey**

For Peer Review Only

User group	Percentage of survey participants
Non-adopters	15%
Introvert users	19%
Versatile users	41%
Expert communicators	25%

**Table 7: Percentage of survey participants in each user group**

For Peer Review Only

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<b>Social media tool</b>	<b>Percentage of survey participants using for work related purposes</b>	<b>Percentage of survey participants using in total (work or social purposes)</b>
Twitter	68%	82%
SNS	57%	72%
Blogs	39%	39%

**Table 8: Percentage of survey participants using each social media tool**

For Peer Review Only

<b>Outcome</b>	<b>Motivation</b>
Learnt something new that has contributed to my work	Self-development
Received useful feedback	
Contributed to my career progression	
Strengthened existing networks	Maintaining networks
Maintained existing networks that I wouldn't have otherwise	
Developed new networks/contacts	Widening networks
Extended the audience of my work	

**Table 9: Options describing outcomes of using social media**

For Peer Review Only





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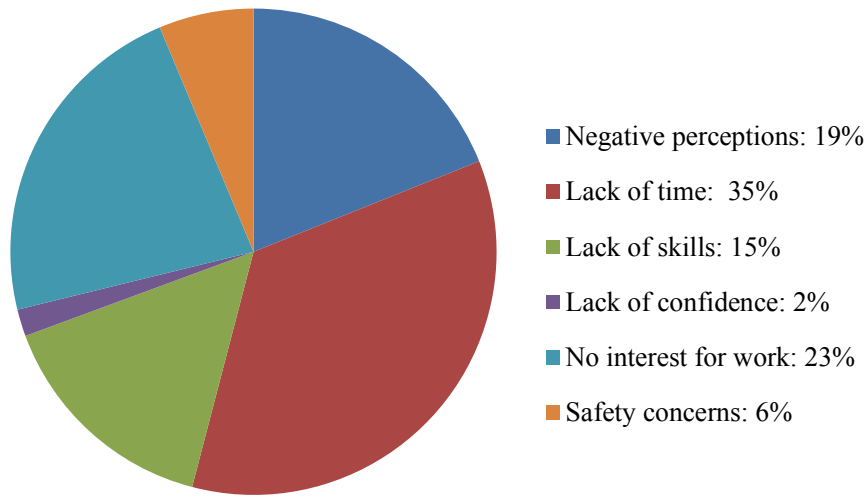


Figure 2: Barriers to using social media

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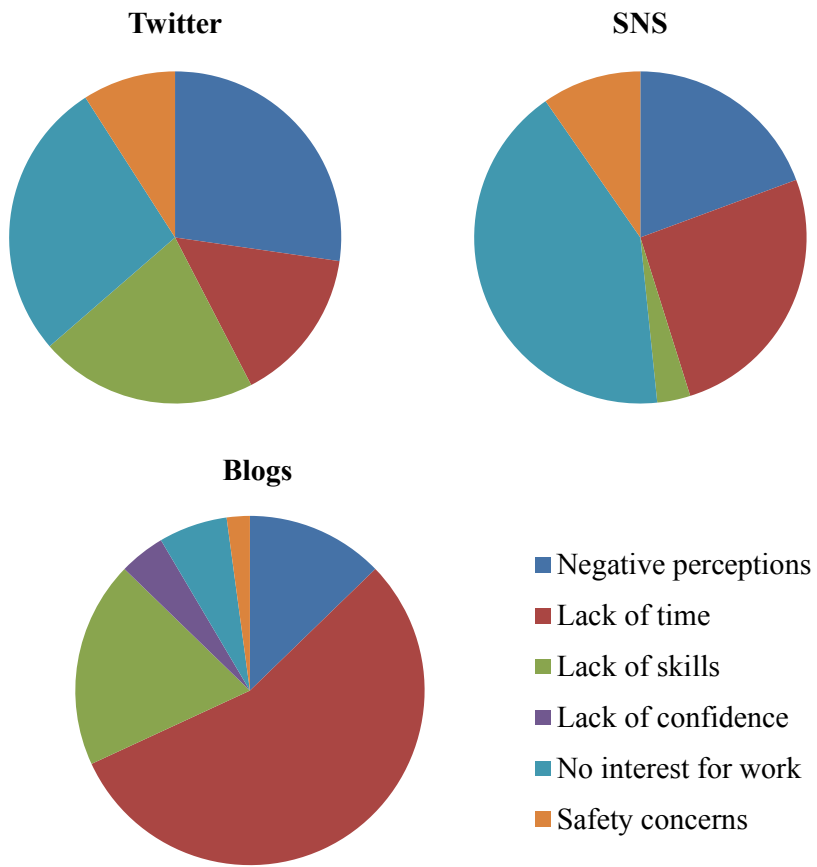


Figure 3: Barriers to using Twitter, SNS and Blogs

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