

Project Title: **Enhancing professional networking
and engagement using social media**

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Executive Summary

The overall aim of this project was to investigate how STEM academics are currently using social media to engage with existing professional networks and extended communities, and to explore ways to support those who want to use these tools more effectively. The project explores the following:

- 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?

The research was carried out in two phases. The first phase, a small scale exploratory study, used interviews and took a qualitative approach. This phase was used to identify key themes and to begin to identify the range of social media activities that STEM academics are already putting into practice. The second phase of the study explored these emerging themes and patterns with a more substantial sample set, and used an online survey to reach a wider audience.

The project identified different approaches to social media that STEM academics are adopting. This ranged from no or very little use of social media to it being integrated into all aspects of work routines. In some cases it was used as a main communication medium rather than email. Examples were identified where social media was being used on a daily basis to find information, record thoughts and outputs, and strategically network. The majority of academics that took part in this research however, were using some form social media within their work practices but to a lesser extent than described above. Social media was not integrated into all daily routines and was not generally a primary channel of communication, more an additional one. In this way, using social media appeared to be an extra task. The use of social media was often more intense around certain events, e.g. at conferences or on completion of a research project.

The different motivations that STEM academics have, and the outcomes they are experiencing through using, social media also varied across the different types of social media investigated (Twitter, social networking sites and blogs). Motivations around self-development, maintaining networks and widening networks were identified and explored in detail. Social media user group profiles: Introvert users; Versatile users; and Expert communicators, that have been developed in other studies are extended in this research to include work-related activities and motivations.

The findings suggest that academics who engage more frequently, with a higher number of social media tools, also tend to have a wider range of motivations for using them, and experience a greater number of successful outcomes. Half of those surveyed, who had integrated social media activities into their daily work routines, felt that they had experienced some positive contribution to their career progression as a result. These users were driven mostly by motivations related to self-development and widening networks. They employed tools that facilitate and promote the sharing of content and felt that this was important to their academic role.

Barriers to participation were also identified. The biggest barriers to those currently not engaging with any great significance are negative perceptions of social media and lack of time, interest or skills. In conclusion, if the use of social media is to be encouraged in academia, practical training is needed, as are dialogues with institutional management to understand the potential benefits and career progression opportunities these activities bring.

1. Aims and scope

1.1 Overall aim

The overall aim of this project was to investigate how STEM academics are currently using social media (such as social networking sites and Twitter) to engage with existing professional networks and extended communities, and to explore ways to support those who want to use these tools more effectively.

1.2 Specific goals

The original goals of the project were:

- To explore how social media is currently used by STEM academics to engage with existing formal and informal networks;
- To explore how social media is currently used by STEM academics to extend the boundaries of these networks to reach broader communities;
- To investigate the motivations for social networking and maintaining professional identities online;
- To support STEM academics in the development of online professional identities and the use of social media to engage with different user communities.

The project was also initially interested in whether there were gendered differences and cultural differences in styles and levels of engagement. The first of these, gendered differences, is to be explored at a later date. The data collected did not enable an examination of cultural differences in sufficient detail.

These original goals evolved over the course of the project and the findings of the research are discussed in this report under the revised headings:

- 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?

2. Activities

2.1 Overall approach

The project used a mixed-methods approach, using interviews and an online survey. The research was carried out in two phases. The first phase took a qualitative approach, and was a small scale exploratory study. This was used to identify key themes and to begin to identify the range of social media activities that STEM academics are already putting into practice. The second phase of the study aimed to explore these emerging themes and patterns with a more substantial sample set, and used an online survey to encourage a wide range and large number of responses.

2.2 What were the planned activities and what changes were made?

The initial plan was use discussions with OU STEM academics staff to identify some of the key issues regarding the use of social media for networking and engagement activities. This was to be followed by a number of more formal interviews, also with OU STEM academics. However, the initial discussions evolved into more formal interviews. Interviews were transcribed and analysed and provided some interesting initial results that enabled the development of a framework within which to structure the findings.

Instead of conducting more interviews, the findings from the interviews were used to develop an online survey with the intention of extending the research beyond the OU to other HE institutions to examine patterns of engagement amongst UK HE academics more generally. It also enabled feedback to be collected from individuals who are not engaging with social media in order to explore the barriers.

2.3 Data

Phase 1: Interviews

Semi-structured, face-to-face interviews were used in the first phase, as these enabled predetermined topics to be discussed and yet allowed unexpected responses to be explored in more detail as they arose. The main aims of the interviews were:

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

Potential participants who were employed as academic or academic-related members of staff within STEM departments at the OU, and that had a work-related social media presence, were identified. This was done through studying the personal website profiles of academic staff to find links to blogs or Twitter usernames. Additionally, the search functionality was used to find those with a presence on Twitter. From the results of these investigations a pool of potential participants was identified. The pool encompassed a range of disciplines, in order to ensure all areas of STEM were included, and a range of different types of social media tools. Invitations to participate in the study were sent to 6 people via e-mail. From these initial invitations 5 people agreed to be interviewed. This number was sufficient to cover the different STEM disciplines and a range of different activities, whilst enabling each interview, and the subsequent analysis, to be in-depth and thorough.

The 5 interviews were conducted over a period of a month (May/June 2012). All interviews were recorded, with the permission of the participants, and then transcribed to assist in the 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;
- General views on having an online professional identity.

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. The survey was tested at several stages in order to avoid the various errors that can occur in online surveys (Anderson & Kanuka, 2003). SurveyMonkey was used to implement the survey.

The survey focused on three specific examples of social media: Twitter, social networking sites (referred to as SNS in this report) and blogging. These had been the focus of discussions in the interviews in the first phase of the research.

Invitations to participate in the survey were distributed via the following email distribution lists: news@mail.heacademy.ac.uk, the Higher Education Academy's (HEA) newsletter; nccpe-pen@jiscmail.ac.uk, a mailing list for those interested in public engagement in HEIs; 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.

Table 1 below provides a summary of the data collected: the time periods for data collection; sample sizes; methods; and approaches used in the two phases of the research. The findings from both phases are discussed in the next section.

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

Table 1: Summary of data collected

3. Findings

Published work that examines the use of social media was reviewed and found to span many disciplines including computer science, in particular computer-mediated communication (e.g. Brandtzaeg, 2012; Lovejoy & Saxton, 2012), social behaviour and psychology (e.g. Pollet et al., 2011; Lorenzo-Romero et al., 2012) and business, management and marketing (e.g. Finkeiner, 2012; Foster et al., 2011). One way of dealing with data that describes how people use technology that emerged is using segmentation – a marketing strategy that aims to divide users into groups based on common needs in order to develop targeted marketing strategies. This ‘Social technographics’ is a market research tool that classifies social media users according to their level of participation and is used by companies to set their social media agendas (Li, 2007; Zhang, 2010). Foster et al. (2011) provide a useful summary of the published work on social media segmentation which provides various frameworks and spans various disciplines including Brand Management (Marketing), Computer Science and Sociology. Of particular note to this research is the work carried out by Ip & Wagner (2008) that studied weblogging (or blogging) activity. Through a series of 33 interviews with bloggers the researchers developed four categories of user based on their usage intensity. In increasing order of usage, from rarely to several times a day, these four categories were: Lurkers, Personal, Active and Habitual. Similarly, more recent work situated within the Social Behaviour literature (Lorenzo-Romero et al., 2012) developed different social networking site user groups by looking at the frequency of different activities, sociodemographic variables, social networking experience and patterns of interaction. They defined three user groups: Introvert users; Versatile users; and Expert communicator. See Table 2 for a brief summary of the activities that describe the typical behaviours of these three user groups.

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

This project used these user groups as a framework and extended the profiles in Table 2 by considering how the different levels of participation in work-related activities may be classified.

In addition to the activities, the motivations that academics have for engaging with these tools, and the perceived outcomes of using them, were explored.

The main findings are discussed below under the headings outlined earlier.

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

A wide range of current practices were identified. Different levels of engagement with social media were identified and mapped onto the user group profiles: Introvert users; Versatile users; and Expert communicators. An additional group, Non-adopters, was also identified. This group represented those individuals who did not use social media at all.

User group	Work-related /professional activities
Introvert users	<ul style="list-style-type: none"> • May use one or two social media tools, infrequently. • May blog very infrequently or log on to Twitter, but to read rather than post. Typically ‘follow’ more than are ‘followed’. • 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.
Versatile users	<ul style="list-style-type: none"> • Engage regularly with one or more social media tools. • May be blogging fairly regularly. • 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’. • 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.
Expert communicators	<ul style="list-style-type: none"> • Use a minimum of 2 different social media tools and typically engage with at least one tool several times a day. • May have several blogs, although the frequency of posts may vary. • Tend to use Twitter very frequently; have a large contact base; are typically followed by more people than they follow. • May use different tools to support different networks. • Typically share ideas/reflections online and make content publicly available through some form of social media, and welcome comments and feedback. • May use profession based SNSs but tend to use them less frequently than the tools facilitating content sharing/commenting.

Table 3: Social media activities

Some academics have fully integrated social media into all aspects of work routines, sometimes using it as a main communication medium rather than email. A degree of ‘addiction’ as previously identified by Ip and Wagner (2008) was seen in a few cases. One interview participant said that he had been ‘weaning’ himself off Twitter as he felt he used it too much. Another described how he was continually looking for new tools and methods to share content. For these academics, Twitter was central to everyday communications – particularly within niche academic networks – and was ‘*constantly on in the background*’. One major differentiating factor of these participants was that they did not describe their use of social media as an additional task, rather it had replaced other more traditional communication channels. Examples were identified where social media was embedded within working practices and was being used on a daily basis to find information, to record thoughts and outputs (for example by using a blog as an online and searchable notebook) and to strategically network.

The majority of academics that took part in this research were using some form social media within their work practices but to a lesser extent than described above. Social media was not integrated into all daily routines and was not generally a primary channel of communication, more an additional one. In this way, using social media appeared to be an extra task. ‘Versatile users’ generally used more than one social media tool and it was often observed that social media was used more intensely around certain events, e.g. at conferences or on completion of a research project. The term ‘Versatile’ implies that these are adaptable users, which in some respects is accurate, but what this does not impart is the intermittent use that was observed in this research. This behaviour was not characterised by any of the user groups defined by Lorenzo-Romero et al. (2012) or Ip & Wagner (2008) and may be a product of the work-related context within which this research took place.

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

Four main themes that describe different motivations for using social media emerged from the data:

- 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.

Substantial differences were observed not only in the activities (as described above) but also the motivations and outcomes described by participants. Moving from Introvert, to Versatile, to Expert, it is obvious that the number of activities observed will increase. It was also observed that the number of motivations increased. Motivations for the different user groups are summarised in Table 4.

User group	Motivations
Introvert users	<ul style="list-style-type: none"> • <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.
Versatile users	<ul style="list-style-type: none"> • <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. • <i>Self-development</i>: Keeping up to date and using social media as a reliable information source. • <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 • <i>Widening networks</i>: using social media to bring the work of an institution to a wider audience;
Expert communicators	<ul style="list-style-type: none"> • <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 • <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 • <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)

Table 4: Motivations for using social media

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

The outcomes of using social media were explored through survey questions where participants were able to select as many options that they felt were applicable, for each social media tool that they used. The options provided in survey questions are illustrated in Table 5. Each of the options is associated with one of the themes relating to motivations identified above and some of the most significant findings are discussed below within the context of these themes.

Outcome	Motivation
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 5: Outcomes of using social media

Self-development

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).

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 on their career progression, open comments were invited to encourage examples to illustrate how. Comments were received (most noticeably with respect to Twitter, but also with respect to SNS and blogging) 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.

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?

The survey undertaken in the second phase of the project included questions that investigated what was preventing some participants from engaging in social media activities. 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.

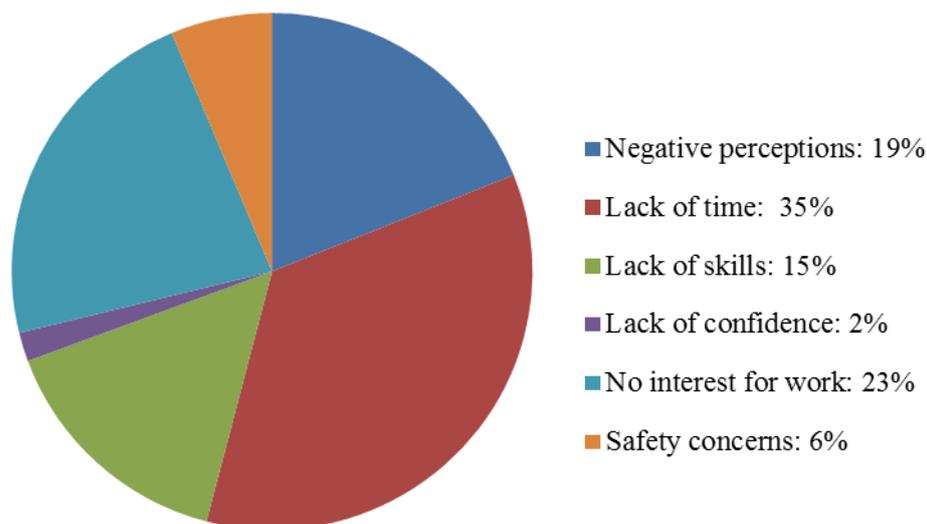


Figure 2: Barriers to using social media

Approximately one third of participants in this research were not using social media much, if at all. Past research has identified two main categories of barrier to the adoption of new technology: functional and psychological (Ram & Sheth, 1989; Tu & Poston, 2012). Functional barriers include situations when the technology is not compatible with users' existing routines or where users are daunted by, amongst other things, the uncertain benefits of using the new technology (Tu & Poston, 2012). Some of the barriers identified in the research presented here, such as a perceived lack of skills or time, or not having an interest in using social media for work-related purposes, are functional barriers. Increasing the perceived usability, that is how easy a technology is to use, and its perceived usefulness, are ways to overcome functional barriers (Davis, 1989; Tu & Poston, 2012). These barriers could most readily be addressed through training or workshops providing, for example: practical guidance on using social media within an academic environment; examples of successful practice; and guidance on writing for specific online environments.

Psychological barriers include a technology being viewed negatively. Terms such as 'superficial', 'inane', 'unproductive' and 'celebrity led' were used. This was one of the main barriers identified in the present research and may not be as easily solved through training. Other measures may be needed to convince sceptics of the potential benefits of social media in the work-place, and more specifically the academic workplace. Initiating dialogues, both with academics who feel they are using social media to successfully support their academic role, but also with management to clarify any institutional policies, may begin to address these barriers. An important aspect of these dialogues is to identify measurable outcomes from an individual's career progression point of view.

Interestingly, very few responses received in this research indicated a lack of confidence in generating online content. This may be because the majority of data collected here was describing barriers faced by Non-adopters and Introvert users. Issues surrounding negative perceptions and a lack of skills may be the first barriers encountered by someone contemplating using social media for work-related purposes.

Lack of confidence in generating the actual content may be something experienced at a later stage once the initial hurdles have been overcome. An interesting follow up to this research would be to explore whether lack of confidence is a bigger barrier to Versatile users who are trying, but struggling, to increase their level of participation. It is possible that Versatile users may have overcome any negative perceptions, and to some extent the skills gap, of Introvert users, and therefore will be confronted by a different set of barriers.

Summary

In summary, this research has highlighted how social media tools are currently being used to support some aspects of the STEM academic role. Examples have been highlighted that show how social media are extending networks and fulfilling the needs of some academics. However, only 50% of those surveyed that currently have high levels of engagement with social media felt that these activities had some positive influence on their own career progression. Social media are not currently viewed by all STEM academics as an essential, or in fact necessary, tool for carrying out their daily tasks.

In conclusion, if the use of social media is to be encouraged in academia, practical training is needed, as are dialogues with institutional management to understand the potential benefits and career progression opportunities these activities bring.

Limitations of the research

The findings were limited by the sample set used. In the first phase of the study, interviews were limited to academics at the OU where the culture of a distance learning environment will have some effect on the use of ICTs and therefore social media. In the second phase of the study, the survey participants were self-selected. Survey responses were invited from STEM academics whether they were or were not using social media, although due to the nature of the mailing lists and networks utilised there is likely to be bias towards those that have had some exposure to social media. In addition, one of the mailing lists used was science based, and although it is unknown exactly what percentage of responses this mailing list generated, there were a proportionally higher number of respondents working in science compared other STEM areas, which may be attributed to this.

These limitations mean that the results are not completely transferable. The patterns of activity and motivations identified, and the user groups developed, may be useful for future studies interested in the use of social media, particularly in an academic environment. Some of the more context specific results may not transfer as readily. In particular, the proportions of people observed within each user group, in both phases of the project, are heavily influenced by the sample sets used.

Impact

This project has contributed to the broad theme of STEM engagement – under the area of *Engaging via digital technologies and tools*. It has explored contemporary means of engaging with user communities.

It has provided a timely investigation that is pertinent to the engagement manifesto and current discussions on digital scholarship. Results have been shared with the Communications office and working relationships established with the 'Catalyst for Public Engagement with Research' team. These working relationships are ongoing and this project continues to contribute to the development of tools for running workshops on research impact and digital engagement.

List of deliverables

Journal paper:

H.Donelan (2014). Social Media for Professional Development and Networking Opportunities in Academia. Accepted for publication in the *Journal of Further and Higher Education*, October 2014.

Conferences:

H.Donelan (2014). 'Social media for increasing the networking and engagement opportunities of academics. Presented at the *Higher Education Academy conference*, July 2014.

H.Donelan, A.Grand & C. Herman (2014). How STEM academics are using social media: a game of snakes and ladders. Presented at the 3rd eSTEEeM annual conference, May 2014.

H.Donelan (2013). Enhancing professional networking and engagement using social media. Presented at the 2nd eSTEEeM annual conference, March 2013.

Other work:

The work undertaken as part of this project has led to connections with the Catalyst for Public Engagement with Research project. This initially led to the workshop presented at the 3rd eSTEEeM conference which enabled discussions on the use of social media through a snakes and ladders board game. This board game has been used at two other workshops and is now being developed further, for use both within and outside the OU. See the following blog posts for more information:

<http://www.open.ac.uk/blogs/per/?p=3153>

<http://www.open.ac.uk/blogs/per/?p=5265>

Figures and tables

Table 1: Summary of data collected

Table 2: A summary of social networking site user groups (Lorenzo-Romero et al., 2012)

Table 3: Social media activities

Table 4: Motivations for using social media

Table 5: Outcomes of using social media

Figure 1: New contacts through social media

Figure 2: Barriers to using social media

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