Connected scholars: Examining the role of social media in research practices of faculty using the UTAUT model

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ABSTRACT

Social media has become mainstream in recent years, and its adoption has skyrocketed. Following this trend among the general public, scholars are also increasingly adopting these tools for their professional work. The current study seeks to learn if, why and how scholars are using social media for communication and information dissemination, as well as validate and update the results of previous scholarship in this area. The study is based on the content analysis of 51 semi-structured interviews of scholars in the Information Science and Technology field. Unlike previous studies, the current work aims not only to highlight the specific social media tools used, but also discover factors that influence intention and use of social media by scholars. To achieve this, the paper uses the Unified Theory of Acceptance and Use of Technology (UTAUT), a widely adopted technology acceptance theory. This paper contributes new knowledge to methodological discussions as it is the first known study to employ UTAUT to interpret scholarly use of social media. It also offers recommendations about how UTAUT can be expanded to better fit examinations of social media use within scholarly practices.

1. Introduction

Since their inception, the use of social media such as blogs, wikis, and social networking websites has increased exponentially, and such media are continually becoming more integrated into our daily lives (Zickuhr, 2010). Scholars in particular are increasingly adopting and adapting these tools for use in their professional work (Collins & Hide, 2010). A recent and very public example of their growing ubiquity involves life science researchers who took to Twitter, a microblogging service, to voice their criticism over an article published in *Science Magazine* that purported to have found a gene that predicted the human lifespan (Mandavilli, 2011). This public "peer review" via Twitter quickly led to the discovery of a problem with the methodology used in the study. This is but one of many recent examples of how social media and networking technologies are changing scholarly practices.

Despite the increased importance of social media to academics, few studies have been conducted in this area, and even fewer have focused on scholars in the Social Sciences. Unlike previous studies, the current work aims not only to highlight the specific social media tools used, but how these tools affect the work of scholars, and vice versa. We seek to discover factors that influence intention and use of social media by scholars. Some previous work on the

motivation behind the wide spread adoption and use of social media have focused on the general public (e.g., Brandtzæg & Heim, 2009; Lin & Lu, 2011) and college students (e.g., Quan-Haase & Young, 2010; Raacke & Bonds-Raacke, 2008). To aid our exploration, we apply the conceptual framework of the Unified Theory of Acceptance and Use of Technology (UTAUT), a widely adopted technology acceptance theory used to explain why some people are more or less likely to adopt and use a particular information technology. This paper contributes new knowledge to methodological discussions as it is the first known study to employ UTAUT to interpret scholarly use of social media. We offer recommendations about how UTAUT can be expanded to better fit examinations of social media use within scholarly practices. The guiding questions for this study are as follows:

(1) What are the most popular social media tools among scholars?
(2) Why are scholars starting to use social media?
(3) What is the perceived utility of social media for scholarly practices?
(4) What are the perceived problems associated with social media?

The current study aims to validate and update the results of previous scholarship, as well as discover potential future trends by analyzing behaviors and perceptions of members of the Information Science and Technology research community. This

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community is known to be technologically savvy and potentially early in adopting new technology such as social media.

2. Defining social media

Social media tools are commonly associated with what is referred to as web 2.0 technologies and the presence of user generated content. The term web 2.0 was first used in the early 2000s. It was used to describe an emerging way of using the internet, with more participatory and collaborative surfing of the web as well as the creation and modification of online content by internet surfers. Some examples of early social media include tools like blogs and wikis, joined later by social networking sites like Friendster, Myspace, and Facebook.

Today an increasing number of websites incorporate user generated content and social networking features, all of which are key characteristics that help to define web 2.0 technologies. The addition of such features to traditional websites is expanding the definition of social media sites and services as well as the number of social activities that users can now conduct on a wide variety of websites across the internet. For example, traditionally solitary activities such as online writing, reading, and reference gathering are now becoming more social, due to the advent of social media sites and services to support these activities such as Google Docs (an online office suite with social features to collaborate, share and publish documents online), Scribd (a document publishing, reading, and sharing platform), and Zotero (a reference management software with a variety of social interaction features such as reference sharing and group settings).

In recognition of this trend, the current study employs a broad definition of social media and defines a social media tool as any website or web-based service that includes web 2.0 characteristics and contains some aspect of user generated content. This includes a wide variety of technologies from video/teleconferencing tools such as Skype and online media repositories such as Flickr, to microblogging tools like Twitter and social networking sites like Facebook and Academia.edu. This inclusive definition was used to gain understanding of academic uses of the broadest possible array of social media (see Table 1). Listserv groups were included in this list because they are considered one of the primary information and communication media among scholars. Furthermore, they also exhibit many characteristics of modern social media such as many-to-many communication and user-generated content.

3. Literature review

Several recent studies suggest how scholars are using web technologies and earlier social media such as blogs and wikis, specifically focusing on their advantages and disadvantages.

Table 1
Social media categories and listserv groups.

1	Blogs (maintain your own blog)
2	Blogs (read/comment on other people's blogs)
3	Microbloging tools – e.g. Twitter
4	Wikis – e.g. Wikipedia, Wikibooks
5	Academic social networking tools – e.g. Academia.edu
6	Non-academic social networking tools – e.g. Facebook, Linkedin
7	Online document management tools – e.g. Google Docs, Scribd
8	Media repositories – e.g. Youtube, Flikr
9	Presentation sharing sites – e.g. SlideShare, Slideboom
10	Social bookmarking tools – e.g. Delicious
11	Bibliographic management sites – e.g. Citeulike, Connotea
12	Video/tele conferencing – e.g. Skype, other IMs
13	Virtual worlds – e.g. Second Life
14	Listserv groups

One of the most commonly cited benefits of social media use by scholars is their ability to facilitate collaboration and communication among peers (especially internationally and across disciplinary boundaries) and with people outside academia (Collins & Hide, 2010; Rowlands, Nicholas, Russell, Canty, & Watkinson, 2011). Keeping up with current research is another common benefit associated with social media use. For example, a study of 10 science bloggers found that as well as writing their own blogs, they often read scientific blogs authored by peers (Bonetta, 2007). Reading such blogs not only served to keep them up to date with research and issues in their field, but also increased their familiarity with other scholars interested in the same topics. Social media also provide space for informal conversations, help to strengthen existing relationships, as well as form new ones with scholars of similar interests and research areas (Gruzd, Wellman, & Takhteyev, 2011). Another frequently cited benefit of social media use is their ability to facilitate information dissemination. For example, blogging tools are being used by many scholars to disseminate information in their field and to the general public (e.g., Bukvova, Kalb, & Schoop, 2010; Luzon, 2009). Being able to explore unasked questions in a less formal atmosphere, finding a strong voice through web writing, and having a place to discuss issues in an open, public format, are just some of the benefits cited by academic bloggers (Kirkup, 2010). Scholarly Twitter users also cite information dissemination as one of the main benefits of this tool which has shown to be especially popular during academic conferences (e.g., Letierce, Passant, Breslin, & Decker 2010; Ross, Terras, Warwick, & Welsh, 2011).

Although the use of social media in scholarly communities has brought many benefits, some limits and concerns have also been raised. One of the most cited barriers to the use of social media in research is the lack of time for it (Rowlands et al., 2011). For instance, a small study of science bloggers found that among other reasons the downside of writing blogs included: the time consuming research required for each blog and the fact that blogs must be updated frequently to be successful (Bonetta, 2007). Copyright issues are also cited as a major concern for scholars worried about the loss of intellectual property rights to their research (Collins & Hide, 2010). Another concern associated with social media use is what Menzies and Newson (2007) call as the "shift from knowledge creation to knowledge production". In their study of 80 scholars, they found that new technologies were described by the participants as both helping and hindering their research abilities and results. Researchers felt they were more productive with the aid of online communication technologies, but that they also decreased their creativity. Other drawbacks mentioned in the study include: an increase of shallow connections internationally at the cost of losing some locally, and a loss of "free time" for deep thinking resulting from the 24/7 nature of digital communication technologies.

Although online technologies are gaining in popularity and importance in scholarly communities, this trend does not always extend to the institutions, organizations, and publishing platforms that support them. Many universities, for example, currently use software and communication systems that are incompatible across departments, institutions, and disciplines, and lack creative tools to facilitate research (Unsworth, 2008). Because of this, academics and research staff may feel dissuaded from using new social media that might otherwise aid their work. Many scholars have also claimed that online publishing as well as the participation in online communities are not supported by their home institution (e.g., Ayris, 2009; Kirkup, 2010). In some extreme cases, drastic action has been taken by institutions to prevent their staff's use of social media, in some instances even leading to the termination of a faculty member, as in the case of one professor who was fired from an American university for posting unspecified material to her

personal blog (Horwedel, 2006). Cases such as this create major setbacks in the adoption of social media by scholars, as indicated by one UK based study of over 1200 academic researchers. The study investigated researchers who used web 2.0 technologies, including blogs, digital repositories, online journals, etc. The study found that scholars who most frequently used social media for professional purposes also had the highest levels of encouragement from local peers and their institution (Collins & Hide, 2010).

Of the research published to date, it is clear that while there are limits to adoption, scholars are beginning to use social media for a wide variety of purposes in their professional lives. However, previous research in this area has primarily focused on the questions of what social media tools are being used by scholars and for what purposes. The current study attempts to go beyond this question and consider what factors influence scholars' adoption and use of social media in the context of their research activities.

4. Methodology

The study consisted of semi-structured interviews with members of the American Society for Information Science and Technology (ASIS&T). Participants were recruited via a direct email invitation before, or an in-person invitation during, the ASIS&T 2010 annual conference. In total, the participant group consisted of 51 conference attendees and individuals recommended by other interviewees. Of the 51 scholars interviewed for this study, 25 were male and 26 were female. To help ensure that there would be a variety of academic experiences amongst participants; interviewees were recruited from different countries, and were working in a variety of positions within academia (see Table 2). The secondary recruitment goal was to ensure that scholars likely and unlikely to use social media in their professional lives were included. This was accomplished by prominently highlighting and encouraging self-identified users and non-users of social media to participate in the interviews.

The first set of interviews was conducted in-person at the ASIS&T conference, which took place in Pittsburgh, Pennsylvania from October 22nd to 27th, 2010. After the conference, individuals who agreed to participate in the study but did not attend the con-

ference were interviewed over the phone. The interviews consisted of 13 guiding questions (see Appendix A). Respondents were first shown the list of different social media tools (see Table 1) and then asked if they used any of them and for what purposes. To make the interview more focused, next we asked to elaborate on their use of one such tool that they defined as their most frequently used tool for research-related activities. Since our primary goal in this study was to learn how scholars communicate and share information with their peers using social media, the interview did not include direct questions about the use of social media for teaching (unless this was mentioned by the participants themselves). Participants were then asked questions pertaining to their thoughts on where social media will be going in the future. In addition to finding out about general trends in social media adoption and use by scholars, we were interested in learning if social media use has changed scholar's attitudes towards more traditional dissemination channels like peer-reviewed journals. As part of the interview process, we also asked the participants whether the administration at their home institutions recognizes social media activities and publications as part of the promotion and tenure review process, and what faculty members think about this possibility.

Interviews lasted between 15 and 40 min depending on the participant. All interviews were recorded using a digital recorder and then manually transcribed. The confidentiality and anonymity of all participants was ensured by making the names of study participants only known to the research team, using aliases for the interview participants in the transcriptions and excluding identifying characteristics in all reports and publications. To analyze the collected data, we adopted a content analysis approach in the tradition of grounded theory (Glaser, 1978; Glaser & Strauss, 1967). We started by exploring the interview data to see what main themes would emerge. Coding was completed using NVivo 9, a qualitative data analysis program. First, a thematic coding schema was developed based on preliminary analysis of interview data through a series of meetings with four researchers, who were involved as interviewers. Some of the main coding categories included general factors such as overall benefits, problems, future trends, etc. The primary coding categories to emerge from the analysis are presented in Table 3. Two research assistants independently coded each interview transcript using the developed coding schema. Once both research assistants completed coding, the two coded datasets were compared using NVivo. There was a high level of agreement between coders: 97% of all coded sections of transcriptions (13,308 items) had an agreement level above 90%. One coded dataset was selected for further data analysis.

To analyze the coded transcripts, we employed the technology adoption model, the Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT is itself a synthesis developed by Venkatesh, Morris, Davis, and Davis (2003) through conducting an extensive review and analysis of eight prominent technology acceptance and use models including Rogers' (1983) Diffusion of Innovation Theory and Davis' (1989) Technology Acceptance Model (TAM). Although UTAUT is less than a decade old, it has already been used in over 40 studies ranging from the selection of mobile devices and services (Carlsson, Carlsson, Hyvönen, Puhakainen, & Walden, 2006) to e-government services in Kuwait (AlAwadhi & Morris A., 2008) and to studying motivators in promoting e-learning in the workplace (Yoo, Han, & Huang, 2012). In the area of social media adoption, UTAUT has been used to study how non-profit organizations use social media for public relations (Curtis et al., 2010), how students in Europe use social media for educational purposes (Onyebuchi, 2009) and, most recently, the study of use and acceptance of social media among health educators (Hanson et al., 2011).

Although UTAUT is usually applied to analyze and explain the quantitative data collected through a survey instrument, the

Table 2
Respondents' demographic information.

Gender	Total
Female	26
Male	25
Country or Region	
United States	29
Canada	17
Europe	5
Position	
Assistant Professor	19
Associate Professor	10
PhD Student	6
Professor	5
Researcher	4
Director/Dean	4
Librarian	2
Instructor	1
Discipline	
Library & Information Science	44
Computer Science	3
Media/Communication Studies	2
Business Administration	1
Engineering	1

Table 3
Primary coding categories with more than one response.

NVivo coding category	Related Interview Question(s)	Number of participants who answered positively
Social media tools	Are you using any social media (SM) for your research-related activities and which ones?	
Used for	What did you use it for? Is that normally how you use it?	Answers varied across different social media sites
Start	When and why did you start using it?	
Others using	Are many of your colleagues using this tool?	
Recommend using	Would you recommend it to others? Why? Why not?	
Improvements	How might it be improved to serve your work better?	
Traditional dissemination channels and social media	Has your use of social media changed your use of more traditional dissemination channels like peer-reviewed journals? If yes, in what way?	
Complements current practices	–//–	27
No change	–//–	13
Large Change (positive or negative)	–//–	10
Benefits from using social media	What benefits have you actually experienced from using it?	
New connections	–//–	30
Existing connections strengthened	–//–	17
Keeping up to date	–//–	15
Promoting work	–//–	13
Maintaining professional image	–//–	3
Problems associated with social media	What do you see as the main problems that are keeping you and others from using social media?	
Time consuming	–//–	34
Privacy	–//–	19
Information overload	–//–	15
Losing control of content	–//–	14
Not authoritative or professional	–//–	10
Hard to learn	–//–	8
Personal/professional boundary loss	–//–	8
Lack of technical support	–//–	2
Pressured to use tools	–//–	2
Tenure and promotion	Does your institution recognize social media activities/publications as part of the promotion/merit component of the faculty review process?	
Not recognized	–//–	43
Recognized	–//–	6
–//–	If they don't, should they?	
Not Considered	–//–	18
Case-by-case	–//–	18
Yes, not sure how	–//–	10
Considered for service	–//–	5
If peer-reviewed	–//–	2

current study has chosen a different approach. Specifically, since this is the first study that uses this model to study scholarly use of social media and due to the emerging nature of this line of research, semi-structured interviews were selected as the primary source for the analysis. We expect that the interview data would allow us to identify and explore a wide range of possible factors that may influence why and how scholars use social media as well as determine the appropriateness of UTAUT for conducting research in this domain.

According to Venkatesh et al. (2003), UTAUT proposed four main factors that influence intention and usage of information technology:

1. *Performance expectancy* – "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (p. 447)
2. *Effort expectancy* – "the degree of ease associated with the use of the system" (p. 450).
3. *Facilitating conditions* – "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system." (p. 453).
4. *Social influence* – "the degree to which an individual perceives that important others believe he or she should use the new system." (p. 451)

Venkatesh et al. (2003) also examined three other constructs such as "anxiety", "self-efficacy" and "attitude toward using technology", but found them non-significant due to the effect cap-

tured as part of the other constructs. For this reason, these three constructs are excluded from this study.

In addition to the four main factors, the UTAUT model includes four additional "moderating" factors: "gender", "age", "experience", and "voluntariness of use" that may increase or decrease the influence of the four main factors on the dependent variables – intention and use behavior. Due to a non-random and relatively small sample of the population in this study, the current data is not well suited to run comparisons across demographic and individual characteristics of the sample such as age or gender. Therefore, the current paper excludes exploration of the possible effects of these moderating factors on the four main constructs.

The results of our study are presented here in thematic divisions. First, we discuss some of the most popular social media tools among scholars and review future trends in this area. Next, we apply UTAUT to analyze the interview data, before discussing UTAUT's applicability to explain scholarly use of social media and make recommendations for expansion of the UTAUT model. The final section summarizes the results.

5. Popular Social Media and Future Trends

Overall, the scholars interviewed for the study were frequent and varied users of social media tools. This was somewhat expected because of the participants' primary research areas (Information Science and Technology). Fig. 1 displays the most popular tools used by the participants.
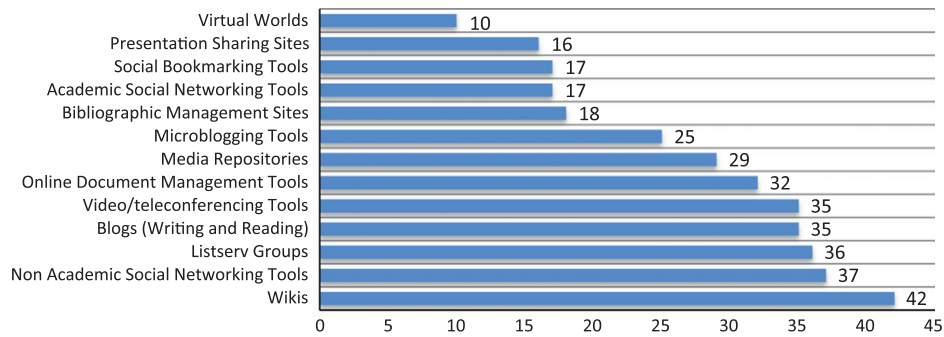
Fig. 1. Social media tools by the number of respondents who use them.

The top five most frequently used tools among the respondents are: Wikis (including Wikipedia), non-academic social networking tools (such as Facebook), Listserv Groups, Blogs (both writing and reading), and video/teleconferencing tools (including Skype). The general popularity of these tools is one of the possible factors contributing to their popularity among the scholars. Listservs are still considered as one of the primary channels for communication and information dissemination in scholarly communities.

Virtual Worlds are the least commonly used tools by these scholars. This was not very surprising as virtual worlds like Second Life are also much less popular among the general public relative to other social media sites, with an estimated one million active users (Rosedale, 2011), comparing this number to over 800 million Facebook users (as of January 2012, Facebook.com). Although some universities rely on virtual environments such as Second Life to teach online classes (Baker, 2009; Warburton, 2009); virtual worlds are not widely utilized for research purposes.

Looking into the future, most of the study participants predicted that social media tools are not merely a fad, but rather represent a shift in the way scholars communicate, collaborate, access, share, and disseminate knowledge and information. The most common prediction made by the participants is that we are going to see more tools that help to integrate and manage multiple social media profiles. This is something that has already begun to take place with tools such as TweetDeck and Hootsuite that enable their users to monitor and post messages simultaneously to multiple social media sites; and new social media tools like Storify.com and Paper.li that allow their users to integrate and creatively present content from across a number of popular social media sites. A greater focus on mobile social media was also often predicted, as were tools that make greater use of visual media. These trends can already be traced in social media tools for the general public.

In short, this section confirmed our general expectations that listservs are still one of the primary Information and Communication Technologies (ICTs) among scholars, and that social media that are popular among the general public are also popular among scholars.

6. Applying UTAUT to aid Understanding of Scholarly Use and Intention to Use Social Media

Here we apply the UTAUT theory to the interview data by examining each of the four main UTAUT constructs ("performance expectancy", "effort expectancy", "facilitating conditions" and "social influence"). Furthermore, we map them over the categories that emerged from the manual content analysis of the transcripts. This facilitates a critical evaluation of the data, and also enables us to draw conclusions regarding suitability of UTAUT in studies of scholarly use of social media. Due to the limited sample of 51 interviews, the following is not a formal evaluation of UTAUT, but rather a general exploration of UTAUT's main constructs as applied to the interview data.

6.1. Performance expectancy

In the UTAUT model, the construct of performance expectancy is represented by statements such as (1) "I would find the system useful in my job", (2) "Using the system enables me to accomplish tasks more quickly", (3) "Using the system increases my productivity" and (4) "If I use the system, I will increase my chances of getting a raise." Based upon the content analysis of the data collected, the most relevant categories to the first three statements that underpin this construct are the ones that relate to the general benefits associated with social media use. As for Statement 4 above, in academia a raise in salary is often associated with faculty promotion. Therefore, the interview topic that is relevant to this construct is closely related to the questions asking the participants whether their home institution recognizes social media activities/publications as part of the promotion/tenure component of the faculty review process, and if social media activities/publications are not officially recognized, then whether a faculty member thinks they should be.

With regard to Statements 1–3, based on the content analysis of the transcripts, the top two benefits mentioned by the respondents were establishing new connections (mentioned by 30 people or 59%) and strengthening existing connections (17 people or 33%). This is not very surprising as these benefits are commonly associated with social media use among the general public as well. For example, Brandtzæg and Heim (2009) found that connecting with new people, keeping in touch with friends and generally socializing were the top three reasons people use social networking sites. Socializing was not mentioned by our participants, as the focus of our study was on the professional use of social media. Interestingly, in some cases new contacts were initiated outside of social media, for example at a conference, and then followed by a friend's request on social media. But in many other cases, new contacts were initiated directly on social media by "strangers" who were interested in a scholar's research. In a few cases, new contacts came through more traditional communication medium such as emails, but the respondents attributed it to their social media presence. For example,

> I have … instances where people don't know me but somehow read my paper and they send me email asking for my research. … So I'm not sure …, if they got to know my publications through social media or some other venue.

When analyzing all of the comments about establishing new contacts via social media, we noticed that a total of 74% (out of 19) of junior scholars (assistant professors) identified that they had made new connections using social media, while only 33% (out of 18) of more senior scholars (associate professors, professors and directors) identified this as a benefit. This is likely because

senior professors have already developed connections through other means before the advent of social media; as a result, they may be less likely to use or even need social media for the purpose of establishing new connections. On the other hand, junior scholars are still developing their professional social networks, and therefore are more likely to use social media to find new contacts. This is a tentative conclusion as the interview data in general, and our sample size, do not enable comparisons across different demographic and affiliation groups.

Also in relation to Statements 1–3, the other 2 popular benefits of social media use were keeping up to date with topics in the field (mentioned by 15 people or 29%) and promoting one's own scholarly work (stated by 13 people or 25%). These are both important factors contributing to scholar's career success. Although the participants did not mention that social media make them more productive or efficient in their work, most of the benefits mentioned by the participants can indirectly contribute to these factors. For example, by establishing new professional contacts and finding new collaborators to work on various projects, a scholar may increase his or her research output. Pao (1992) found collaboration helps to advance one's research and increase the productivity of the "highly productive". Similarly, Stvilia et al. (2011) found that collaborating outside one's disciplinary boundaries increases team productivity as measured in the number of publications.

Statement 4, the final statement to be investigated under this construct, relates to increasing the chance of getting a raise in salary due to social media usage. As mentioned above, this statement is closely associated with the question on the tenure and promotion review of a faculty member. Based on the responses, in the majority of the cases (reported by 43 people or 84%) social media activities or publications are not officially recognized as part of the tenure and review process by their home institutions. About one third of the respondents (18 people or 35%) agreed with this position by their institution. The remaining two thirds felt that social media activities/publications should be considered during the promotion and tenure review to some extent. This suggests on the one hand, at least for one third of the scholars, this component of "performance expectancy" is not important because, whether they use social media or not, the respondents agreed with their administration that social media use should not count in tenure consideration. For the rest of the group, there is a clear difference in their expectations and the status quo. However, most of these scholars were not definitive or clear in their expectations. For example, some (18 people) felt social media use should be considered on a case-by-case basis, others thought it should be treated as a service component (five people), and 10 people were not sure to what extent or how it should be considered in the context of tenure review. Based on these observations, the question of whether a scholar's home institution officially supports scholarly use of social media would have a weak to no effect on the scholar's final decision to use social media or not. This situation may change if more institutions adopt official policies to recognize social media use for knowledge production.

Overall, it was confirmed that social media use supports many key tasks in a scholar's academic life from building and supporting peer networks to staying informed on relevant research topics. Therefore, we expect that "performance expectancy" will be positively associated with intention and use of social media for this group of scholars.

6.2. Effort expectancy

This construct is characterized by the following statements: (1) "My interaction with the system would be clear and understandable", (2) "It would be easy for me to become skillful at using the system", (3) "I would find the system easy to use." and (4)

"Learning to operate the system is easy for me." From the model perspective, these four statements, although very similar, are designed to measure slightly different aspects of the same construct. Such an approach is very common when collecting data through surveys, especially when trying to capture an abstract concept such as "effort expectancy". However, when dealing with semi-structured interviews it can be very difficult to differentiate between each of these four very similar statements. Therefore, all four statements will be evaluated all together, focusing on interview statements about ease of use, clarity and learnability of social media tools. The categories related to these statements in our coding schema were as follows. First, the most relevant category relates to the easy/difficulty associated with learning how to use social media (Hard to Learn). Other relevant categories/issues raised by the scholars, relevant to this construct, include difficulties of managing private versus public content (Privacy), difficulties of managing information flow and contacts from both personal and professional circles (Personal/Professional Boundary Loss), and the inability to control who can do what with the content that is posted on social media (Losing Control of Content).

Since all of the respondents are scholars in the Information Technology-related fields, only a few (8 people or 16%) respondents felt that there is a learning curve associated with how to use various social media tools. Interestingly, further analysis of the challenges identified by these eight respondents revealed that most of the challenges were not associated with the actual learning of how to use any particular tool, but had more to do with keeping up with and adapting to the constantly changing features, functionalities and usage policy associated with the various social media tools. As expressed by one of the participants, "[b]ecause when you become familiar with it you then have to figure out what and where, what's happening again".

The main concerns around "ease of use" and "clarity" in relation to social media were the issues surrounding privacy (raised by 19 people or 37%), followed by issues of inability to control the content posted to social media (raised by 15 people or 29%), and then by challenges of managing personal and professional contacts on social media or, as one interviewee put it, the issue of "wear[ing] 2 hats" (expressed by 8 people or 16%). Many scholars in the study felt that the current social media tools are ill-equipped to deal with these issues or unclear about their practices and policies. For example, here is what one of the participants stated regarding privacy issues on social media:

> Well the one big issue, a lot of it is privacy, like for example with Facebook. Obviously these companies... some of these people are getting into your Facebook account, and using it to market their information.

We also found that this issue connects directly to two other issues raised by the participants ("Personal/Professional Boundary Loss" and "Losing Control of Content"), as described by the following quote:

> …it can be difficult to maintain personal and professional distinctions on [social media]. Therefore, you have to be careful what you share on [social media], especially because you do not know who is reading what you are putting out there.

To support this statement, the participant then gave example of how the local newspaper follows them on Twitter.

To address these issues, some scholars created multiple social media profiles – some profiles to be exclusively used for personal interactions and others for professional. Others scholars tried to set clear boundaries as to what they post and whom they friend online. However, even with these tactics, a scholar in the study noted that it can still be difficult to control these boundaries since there are no mechanism in place to prevent a colleague from reposting profes-

sional content to spaces which are designated as "personal", and thus, "dragging" a person into a discussion whether wanted or not.

The challenge of managing personal and professional contacts on social media was primarily raised by Facebook users. This is something that would be expected as Facebook is designed for the general public and as such will likely include both personal and professional contacts. In recent years, we have seen the rapid development of social media tools that are specifically designed for niche communities such as academics, examples of which include academic social networking sites like http://Academia.edu or http://ResearchGate.net. If this trend continues and more academics join these sites, issues related to the personal and professional boundary loss will likely become less important.

Most of the issues raised above such as learnability of social media tools or privacy issues can be addressed through a systematic evaluation and redesign of social media tools, better written documentation and tutorials, training offered to faculty members, and clearly defined policies on social media sites. However, at least one of these issues such as the feeling of losing control of one's own content posted to social media is inherent in the way social media operates. By design, these ICTs are made to encourage social interaction and sharing with others in the system; and as with any social system, such free flowing social exchanges may trigger concerns regarding losing control over information flow as well as trust issues regarding other social media users with whom such exchange happens.

In sum, "effort expectancy" has proven to be a very influential construct on what social media tools the scholars in the study decided to use and how they use it. Although learnability of social media tools was a lesser issue for this group, the participants raised related concerns regarding difficulties of managing personal and professional information on these sites.

6.3. Facilitating conditions

Following the UTAUT theory, the "facilitating conditions" construct is characterized by the following four statements: (1) "I have the resources necessary to use the system," (2) "I have the knowledge necessary to use the system", (3) "The system is not compatible with other systems I use" and (4) "A specific person (or group) is available for assistance with system difficulties". To evaluate the "facilitating conditions" construct for social media, we will see how it fares under each of the four statements. Arguably, one of the most precious resources that scholars have (or do not have) is time and related to it is the shared perception that they are suffering from information overload in their professional lives. Therefore, to fully understand the first statement about "having the resources necessary to use the system", we decided it was best to translate it into two separate categories in our coding schema: Time Consuming and Information Overload; both are found under the problems associated with social media. The second statement about "having knowledge necessary to use the system" is less relevant for the sample population as discussed in the previous section on "effort expectancy". As a result, we expect that the majority of these participants would have the necessary knowledge to use or learn how to use social media if needed. The third statement is closely related to our survey question and discussion about how social media affect the traditional knowledge dissemination channels (Traditional Dissemination Channels and Social Media). And the fourth statement can be associated with instances when respondents referenced the lack of technical support at their home institutions (Lack of Technical Support).

More than half of the participants (34 people or 67%) said that the main problem with social media use is its time consuming nature, stating that "*for me the focus on any kind of difficulty is always how can I make this more efficient time wise*" and "*if you're going to main-*

tain *things like blogs or Twitters and everything – it just takes too much time. I'm not going to put the time into it.*" This in fact was the most common concern shared by this group of scholars. Scholars also expressed their concern that social media require them constantly to monitor messages coming through different social media channels which often leads to information overload (stated by 15 people or 29%). The following quote from a participant highlights the relationship between the information overload and time constraints that academics experience: "*I couldn't keep up with all the stuff that people are sending out on Facebook. You know? They just send out everything about everything, and I just... don't have time.*" But, time constraint and information overload are not unique to social media. For example, in the past, scholars have also raised their concerns about the time consuming nature of emails and other internet-enabled technologies (Heijstra & Rafnsdottir, 2010). But it is possible that these factors are more pronounced for social media as compared to existing workplace technologies. There are a myriad of choices when it comes to social media tools, and they each come with a different set of features and uses, catering to a wide variety of different audiences. As a result, it is possible that scholars feel that as a user of social media you are expected to adopt the whole suite of tools from a blogging platform, to microblogging site like Twitter, to an account on a photo sharing site like Flickr to share pictures, and so on.

When assessing "facilitating conditions", another key issue is whether new technology (in our case, social media) fits with the existing practices. For academia, one of the most important practices is knowledge dissemination, which usually happens through conference presentations or publications. As part of this study, we wanted to know whether social media activities influence a scholar's perception of traditional knowledge dissemination practices. When asked if social media use had changed their view of more traditional dissemination channels like peer-reviewed journals, about half of the scholars (27 people or 53%) said that social media use complements traditional dissemination channels. In particular, most of these scholars see social media as a communication tool to promote work that is published in more traditional venues, as summarized by the following quote from the study:

> I don't see those as the same thing. I see the activity [...] as being primarily, like you know, part of communication during the research stage. When something is ready to be disseminated like through a conference or through a technical report or through a journal publication then I advertise that, but advertising is not quite the right word, but you know I promote it I guess using these kinds of online social media...

This suggests that this facilitating condition would have a positive impact on scholarly decisions to adopt social media. However, it is still unclear whether constraints on time and attention span (as related to information overload) will be outweighed by the fact that social media might complement traditional knowledge dissemination practices.

Finally, the lack of technical support from the home institutions was only raised by two people in the study, suggesting that this might be a less of an issue when scholars are making a decision to adopt social media for their professional work. Also when scholars did express their concern regarding the lack of technical support, it was not directed to just social media, but generally to their IT support department in their institutions. For example, "*...you don't know about [University Name], but we don't really have a really good support in terms of technology*". Also these comments mostly related to teaching in an online environment and not necessarily research-related activities: "*...I don't feel like I've been trained well enough to really make classes that are really good.*" This may suggest that scholars have a lesser expectation from their IT support when it comes to their research than to their teaching. This

may be also because generally speaking, scholars have more flexibility in deciding whether they adopt new technology for their research activities, and less flexibility when it comes to the technology that they must use as part of their teaching duties.

In sum, based on our sample, we anticipate that "facilitating conditions" will be negatively associated with a scholar's decision to use social media, primarily due to its time consuming nature and contribution to the feeling of information overload.

6.4. Social influence

When measuring the "social influence" construct, Venkatesh et al. (2003) used statements such as (1) "People who influence my behavior think that I should use the system", (2) "People who are important to me think that I should use the system", (3) "The senior management of this business has been helpful in the use of the system" and (4) "In general, the organization has supported the use of the system". The first two statements of this construct will be evaluated through the interview categories that addressed the question of why scholars started using a particular system (Start), if their colleagues use social media (Others Using) and whether they would recommend a particular social media to others (Recommend Using). The third and fourth statements, regarding the managerial and organizational support, closely relate to the questions around the tenure and promotion review. Since this topic was already discussed in Section 6.1 on "performance expectancy", it will not be covered in this section, other than acknowledging the fact there is a possible connection between the "performance expectancy" and "social influence" constructs.

Based on the analysis of the transcripts, "social influence" undoubtedly plays an important role in one's intention to use and use of social media. When describing why they started using a social media tool, many interviewees referred to a situation when a tool was recommended by other colleagues. Here is an example of how one scholar describes why she started blogging:

> I think I started blogging in 2007, in September 2007, and it was motivated by academic friends of mine in an adjacent institute … And, I took it on trust that it was a useful thing to do…

Interestingly, when asked whether they know many other colleagues using social media, the respondents who said yes, referred to other people but not necessarily colleagues in their own institutions. For instance, another blogger in the study mentioned in response to this question:

> The ones who I work with on a daily basis really aren't [blogging], … but mostly the colleagues who blog are people that I've met through their blogging.

The above quote is also a good example of how social media helps to build research connections outside of one's own institution.

It is important to note that social influence does not necessarily come from peers. It may also come from friends or family members in cases when personal adoption of social media preceded their professional use. There were also instances when social influence came from students in a research lab or from students in a classroom, as demonstrated in the following statement:

> … in many cases we have school teachers who are in the media program and the students know much more about these applications than them. So the teachers and the librarians are kind of being left behind their students. They have used so many more of these because they have grown up in the media age so for the teachers it's a learning curve.

Social influence may have positive as well as negative impact. In some instances we found that it may add a considerable amount of stress into one's academic life. As one faculty said:

> There is a lot of pressure, so I think a lot of faculty are starting to feel, [now] they want me to have a blog, now they're wanting me to do a certain thing, and that's just adding certain levels of stress.

One of the possible explanations of this pressure to join and use social media is due to the abundance of positive discourse around social media and benefits of using it, especially as perceived by non-users. As the previous participant stated:

> There's a great discourse around social media and how valuable they are, and it tend to be a very Ra Ra discourse, very positive, which leads a lot of people to feel that they're behind if they're not doing these things, even though in reality I feel that most people are not doing these things.

The example above demonstrates that under certain conditions, social influence may lead to stress and anxiety about social media use and may in turn lead some scholars to decide not to adopt social media.

Overall, we find that "social influence" does play a positive role in scholar's intention to use social media, but it does not necessarily come from within their home organization but may come from other colleagues within or outside the same discipline. Furthermore, as the UTAUT theory predicts, social influence may have a much stronger effect on behavioral intention rather than on the actual use of social media. For example, social influence may encourage someone to start using a social media tool, but it is not necessarily that the person will stay with the tool; in words of one participant: "I got pressured into joining [Facebook] like a lot of people do and then decided that this wasn't for me, so I really am not active."

7. Discussion

Overall, we found that the UTAUT constructs were a useful starting point in studying scholarly behavioral intention and use of social media. We now review the main results discovered during the mapping procedure and discuss some of the limitations of using UTAUT to examine scholarly use of social media. We also outline some suggestions as to how UTAUT can be expanded to make it more suitable for studying social media adoption and usage and conclude with suggestions for future studies in this area.

We found that for this sample population, "performance expectancy" is positively associated with the intention and use of social media. The primary performance booster that scholars saw in social media tools is their ability to find new professional connections. Other common benefits of being on social media include maintaining existing contacts, keeping up to date with the developments in the field and promoting one's own work to peers and outside communities such as industry, practitioners, journalists, and the public at large.

As for "effort expectancy", we expect that for this sample population this particular construct will have a negative association with the intention and use of social media, primarily due to the privacy concerns, difficulties of managing personal and professional contacts, as well as fear of losing control over the content posted to social media. Although not investigated in this paper, the last issue might be a better fit with another construct originally proposed and tested in UTAUT – "anxiety". The original work on UTAUT found computer anxiety non-significant due to the effect captured as part of the "effort expectancy" construct. In future work, we are interested in exploring the impact of other UTAUT constructs that were previously found to be non-significant such as "anxiety", "self-efficacy" and "attitude toward using technology". All of these were excluded from this study.

Similar to "effort expectancy", we anticipate that the "facilitating conditions" construct will have a negative effect on scholarly use of social media for this group. This is primarily related to the fact that many respondents reported concerns about time constraints and a

related feeling of information overload in association with using social media. The latter category is also a good candidate for inclusion into the "anxiety" construct, as discussed above. Interestingly, the lack of technical support was mentioned by very few participants. One possible explanation is that this group is computer-savvy and might require less help with learning a new technology. Another possibility is that social media use is currently not perceived as something that universities require their faculty to be involved in, and therefore there is no expectation from the faculty side to receive technical support from the university (except in cases of using web technology for online teaching).

Finally, we found that the "social influence" construct plays an important, positive role on one's decision to use social media (except in the case discussed below). This was clearly shown during the discussion of why people started using social media and also by the participants' general willingness to recommend the social media tool(s) that they are using to peers. At the same time, we also noted a limitation in the original formulation of this construct when applying it to the current population. Rooted in organizational studies, this construct primarily focuses on the influence that is coming from within the organization, and primarily from the top to down. In academia, social influence can come from all directions: from senior colleagues and administrators within the institution, students, peers at other institutions and even non-academic friends or family members who first introduced a social media tool to a scholar. Based on these observations, we propose to expand UTAUT to include other forms of social influence as discussed above.

Although the current paper did not purposely explore the possible effect of moderating factors such as "gender", "age", "experience", and "voluntariness of use" on the four main UTAUT constructs we did observe that "voluntariness of use" played a moderating effect on social influence. According to the theory, a moderating factor may increase or decrease the effect of a construct on the dependent variables – intention and use behavior. Although most of social media use in academia can be considered voluntary in nature, there may be situations (similar to the one described in Section 6.4) where social influence can turn into social pressure, and social media use will be perceived as an obligation and thus may turn some non-users against social media. This may happen as a way to cope with a feeling of stress or to rebel against a newly formed "norm" to use social media. Thus, we would expect this to have a negative effect and act as a moderating factor on intention and use of social media in certain situations. According to the UTAUT model, the positive effect on intention and use should increase when the level of "voluntariness" decreases. However, that is not what we observed. This may indicate an inconsistency between what we observed in our sample and what would be predicted by the UTAUT theory. Or it may be an indicator that the two individuals who raised the point of "pressured to use" are late adopters (sometimes referred to as "laggards"; Rogers, 1983). If the latter is true, then it could be that it just requires more time for an innovation to reach late adopters through peer networks and other channels. However, since the current data only represents a single point in time of a single sample, it is impossible to answer this question definitively with the current data. Future work will include following up with the same group of participants to see whether their attitudes towards social media use have changed over time and, if yes, how.

Finally, there was one interview category, "Not Authoritative or Professional" (raised by 10 people or 20%), that did not lend itself well to any of the four main constructs from the UTAUT theory. The challenge of assigning this interview category to any of the four UTAUT constructs is that respondents in the study often use "being authoritative" and "being professional" interchangeably as well as in different contexts. This makes it difficult to assign it to just one construct. For example, when speaking about not being "professional", some respondents referred to the lack of certain features in social media tools which rendered them "unprofessional"; for example, "It's just at the moment I think it's not a conduit for quality professional work, it's the conduit for sorta lighter personal content." In other cases, not "being authoritative or professional" referred to academic publishing: ". . .it's really dangerous for us to publish our ideas outside of peer-reviewed spaces, like the more traditional peer-reviewed spaces because that's so not totally valued by all of academic." To untangle this particular category in a future study, it might be best to split it into more specific categories or to merge it with related categories.

The limitation of the analysis is that it does not make a clear separation between intention to use social media and the actual use. This is because most of the participants were users of at least one social media tool. Only nine people in the study did not use any social media at the time of the interview. Future work will focus on trying to separate intention to use and use more clearly. Also although the current sample included a good mix of different users (heavy and light users) and non-users of social media future work will attempt to recruit more non-users of the technology. Future work will also explore other technology adoption and use theories including the Uses and Gratifications (U&G) theory (see Ruggiero, 2000 for review of studies in this area) that has also been successfully applied to study what motivates people to use social media (e.g., Quan-Haase & Young, 2010).

8. Conclusions

The current study was based on 51 semi-structured interviews with scholars mainly in the Information Science and Technology field in North America. These participants provided us with a wealth of knowledge about how scholars are beginning to integrate social media into their professional lives, their benefits, problems, and future trends. Also, this was the first known study that uses UTAUT to explain scholarly use of social media. The paper demonstrates how UTAUT can be applied in this context and made a number of recommendations for its future application. Below are summaries of the findings related to the four guiding questions set forth at the beginning of this research.

8.1. What are the most popular social media tools among scholars?

Some tools emerged as overall favorites among scholars; wikis, non-academic social networking tools, listservs, blogs, and video & teleconferencing tools emerged as the top five most frequently used. It is likely that because non-academic social networking tools, such as Facebook, are popular among the general public, they have therefore been adopted by scholars and eventually used in their professional lives as well. Wikis and blogs are social media tools which are also very flexible, and can be adapted (and often are) from their more common recreational purposes to professional functions. Listservs have been and still are very popular within the academia community, will likely remain an important communicative tool within academic circles. And as expected video/teleconferencing tools are popular also, as they are often used for collaborative meetings. The absence of microblogging tools such as Twitter, in the top five indicates their relatively recent arrival, thus explaining their relatively low adoption rate among scholars in this study.

8.2. Why are scholars starting to use social media?

As highlighted by the literature review, scholars are turning to social media tools professionally because they are more convenient for making new connections with peers, collaboration, and research dissemination. These benefits are reinforced by the interview results, especially the formation of new professional connections, which was one of the main benefits listed by the participants. Another aspect of scholarly adoption of social media tools in their work

may also be explained in a broader context by the general public's increasing reliance and use of social media, as well as social influence to adopt these tools from peers, friends and students.

8.3. What is the perceived utility of social media?

Our study found that scholars who used social media sites in their professional lives found them useful for making new connections, as well as strengthening existing connections, keeping up to date in their field, promoting their work online, and maintaining their professional image. These benefits are important for all academics, but especially for junior scholars who are still in the process of developing their network of peers, their professional image, and their portfolio of work and expertise. This was recognized by the interviewees, where senior scholars admitted to not using as many social media sites, or using them less frequently, them their junior participants

8.4. What are the perceived problems associated with social media?

Protection of privacy is the number one concern of scholars when using social media tools. This was found in the literature review as well as the interview analysis. However, it is still not clear to what extent this is a real threat. Nevertheless, the privacy concern is not unfounded; at least one of the interview participants explained that they had had their Twitter identity stolen and used by the thief to send inappropriate messages and posts to their Twitter network. Because this scholar had a very solid network of peers on Twitter, who were familiar with this scholar's regular posts, they notified the scholar via email and the account was shut down. No lasting damage to their professional reputation occurred as a result, showing that even though these social media tools may come with some risks in terms of privacy, as long as they are monitored these risks can be minimized and dealt with very quickly. No other scholar in the study had a firsthand experience like this.

In sum, scholars are increasingly adopting social media in their professional lives for research-related activities. The scholars who participated in the interviews on average have adopted more than one tool in their professional practices. The results of this study also suggest that the adoption rate will likely continue to rise as social media tools become more accessible, widely adopted and specialized. It is also clear that the lack of social media tools specifically designed for academia may be one of the main reasons why some scholars are still hesitant about adopting social media tools wholeheartedly. But this may be changing as more and more social media tools specifically targeting academics are emerging. Publishers of scholarly work are also increasingly adding social media and networking capabilities to their digital resources. In fact, scholarly journals are not only using social media themselves, but are actually developing ways to measure scholars' impact in social media. For example, the Public Library of Science (PLoS) has developed ways to measure the number of times an article is bookmarked, and the number of mentions of the article on social media such as blogs. By incorporating mentions of scholarly articles in social media, PLoS and other publishers are now recognizing their importance in scholarly publication. The integration of social media tools by trusted publishers will likely reinforce the benefits and importance of their use by scholars in the future.

Acknowledgments

Appendix A. Interview Protocol

The set of questions below are suggested guidelines only and should serve to start the interview. Interviewers may pursue points of particular interest that may arise during the interview even if it means not following the list below.

Opening Questions
1. Are you using any social media (SM) for your research-related activities and which ones?
   If the interviewee does not use any SM – go to question #8
2. Which SM did you use most frequently as part of your research-related activity?
   A–B What did you use it for? Is that normally how you use it?
   C. When and why did you start using it?
   D. What benefits have you actually experienced from using it?
   E. How might it be improved to serve your work better?
   F. Are many of your colleagues using this tool?
   G. Would you recommend it to others? Why? Why not?
3. What other SM tools do you [use]/[find useful] for your research-related activities?
   A. Can you give specific examples of how they were useful?
4. Has your use of SM changed your use of more traditional dissemination channels like peer-reviewed journals? If yes, in what way?
5. Do you use SM for personal use? Why? How?

International/Industry contacts
6. Has any SM tools helped you make new contacts? (Domestically? Internationally? Companies? Individuals?)
   A. Please explain or give a recent example(s).

Media Exposure
7. Has SM helped you to reach popular media outlet or a wider audience?
   A. Please explain or give a recent example(s)

If the interviewee does not use SM
8. What do you see as the main problems that are keeping you and others from using SM?

Tenure and Promotion
9. Does the administration at your institution recognize SM publications as part of the promotion/merit component of the faculty review process? (If yes, specify)
10. If they do, how significantly do you think they weigh its merits? If they don't, should they? Why?

The Future
11. Do you see these SM tools being useful to you or others in 5 years?
12. As a scholar in Information Science, what other SM tools do you see emerging in the future?
13. Where do you see SM heading for research-related activities?

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