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Impact of social networking tools on scholarly communication: a cross-institutional study

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Abstract

Purpose – This paper aims to investigate the extent to which social networking tools had an impact on academics' patterns of informal scholarly communication in humanities and social science disciplines. Social networking tools, reinforced by proliferation and advances in portable computing and wireless technologies, have reshaped how information is produced, communicated and consumed.

Design/methodology/approach – A cross-institutional quantitative study utilized an online questionnaire survey sent to 382 academics affiliated with humanities and social science disciplines in two different academic institutions: one that belongs to a Western tradition of scholarly communication in Ireland, and the other to a developing country in Oman. Descriptive interpretation of data compared findings from both universities. Frequencies, percentages and means were displayed in tables to enhance the meaning of collected data. Inferential analysis was also conducted to determine statistical significance.

Findings – Overall findings indicate progressive use of social networking tools for informal scholarly communication. There is perceived usefulness on the impact of social networking tools on patterns of informal scholarly communication. However, nearly one-third of the respondents have never used social networking tools for informal scholarly communication. Institution-based data comparison revealed no significant differences on data except for few activities of informal scholarly communication.

Research limitations/implications – Given that the number of study subjects was eventually small (total = 382) and that academics by their very nature are disinclined to respond to online surveys, results of the study may suggest non-response errors, and these may impact negatively on the acceptability of inferences and statistical conclusions. The results of the study are, therefore, unlikely to be useful for generalization, but they remain suggestive of a growing tendency among humanities and social sciences' academics to use social networking tools for informal scholarly communication.

Originality/value – Empirical findings provide a broad understanding about the potential of social networking tools on informal scholarly communication in areas of humanities and social sciences disciplines. Multi-disciplinary investigation and qualitative studies may further deepen our understanding of the impact of social networking tools on patterns of scholarly communication.

Keywords Social media, Scholarly communication, Sultan Qaboos university, Social networking tools, Informal scholarly communication, University college Dublin

Paper type Research paper

Introduction

The rapid acceptance and implementation of social networking tools for interacting and exchanging ideas has transformed the process of research and scholarly communication in the academic environment (Gruzd *et al.*, 2012). Social networking tools have had a fundamental impact of networked information on academics' manners and the attitudes in which they work, correspond, access information, collaborate and disseminate their research outputs (Nikam and Babu, 2009; Molina, 2012; Vuori and Okkonen, 2012). This research examines the patterns of use and the impact of social networking tools on research practices and perceptions among academics affiliated with the humanities and social sciences in two different university settings. The study also identifies and assesses potential gaps – if they exist – around the adoption of social networking tools for informal scholarly communication between the surveyed academics in each institution. It is hoped that this research will contribute to the knowledge on scholarly communication and social media by identifying current practices and the extent to which social networking tools are used in different academic settings for informal scholarly communication.

The research questions guiding this research were as follows:

*RQ*1. What is the extent to which academics in the humanities and social sciences use social networking tools for informal scholarly communication?

*RQ*2. How does the use of social networking tools impact patterns and practices of informal scholarly communication among academics?

*RQ*3. What barriers, if any, are faced by academics in their assessment or implementation of social networking tools for informal scholarly communication?

*RQ*4. What differences in the level of use, perceptions and usefulness of social networking tools for informal scholarly communication exist across institutions?

Conceptual background

There are a number of terms associated with social networking communication. Social networking sites, social networking tools, social media and Web 2.0 are terms that are used interchangeably in the literature to describe the interactive and collaborative environment of the Internet which gained popularity in the mid-2000s. The phrase Web 2.0 has been used inclusively to encompass computer-to-human interactions, such as the Semantic Web, Google Scholar and Wikipedia (Procter *et al.*, 2010; Molina, 2012). For the purposes of this project, the term *social networking tools* focuses on the interactive and collaborative environment of the Internet. Social networking tools allow individuals or groups to construct public or semi-public profiles and to facilitate communication with other users. Examples of popular tools include: Facebook, Twitter, Google+, LinkedIn, Blogger, Connotea, Pinterest, YouTube, Flickr, Skype and Whatsapp, among others. The number of tools has increased dramatically in recent years, and they are generally used more frequently for personal rather than for academic purposes (Chen and Bryer, 2012; Cassidy *et al.*, 2011; Tiryakioglu and Erzurum, 2011; Lenhart *et al.*, 2010).

Informal scholarly communication, as opposed to formal scholarly communication, refers to the interactive communication that takes place at any time and in any format. This includes, but is not limited to, exchanging letters, reports, texts, multimedia,

conversations and so forth for the purpose of acquiring information, maintaining relationships and working collaboratively. Gresham (1994) suggested that research productivity may be influenced and facilitated by informal contacts and communication among scholars and researchers in certain disciplines.

Informal scholarly communication has been reshaped significantly through the ages. In the 1640s, for example, "scientists began to meet informally – we have noted meetings at the residence of *Mersenne*, but they took place also at the homes of many rich patrons" (Vickery, 2000, p. 67). New means of transportation and telecommunications have also transformed informal scholarly communication. Letters, telephone calls and conference meetings were common tools for informal scholarly communication (Nikam and Babu, 2009) before the advent of networked information by means of e-mails, bulletin boards, mailing lists, Internet chat and video conferencing (Al-Aufi and Genoni, 2010; Matzat, 2004; Heterick, 2002).

However, informal scholarly communication has again been recently advanced by the influence of the interactive web and social networks. As a result, new concepts, such as "Scholarly Communication 2.0" and "Science 2.0" have emerged to describe the transformation originally labelled Web 2.0 (Nikam and Babu, 2009; Ponte and Simon, 2011; Molina, 2012).

The importance of informal scholarly communication is determined by its effect on the development of ideas and information (Poland, 1991; Crane, 1972). It is also described as the essence of formal publication and viewed as the "lifeblood" of scholarly endeavour (Gresham, 1994). New ideas are formulated and produced through this practice, which is supported by the exchange of information and reception of peers' feedback (Cronin, 1982). It can be defined simply as exchanging ideas and information among academics, creating and maintaining relationships with peers and collaborating for the advancement of knowledge.

Context of the study
The current study took place in two different academic contexts:

(1) Sultan Qaboos University (SQU).
(2) University College Dublin (UCD).

The project was initiated during the research visit of one author to UCD from SQU. The two institutions formed a natural choice of contexts for beginning this research. This section briefly describes the general characteristics of each university. Both universities are known as the largest in their countries, but they differ relatively in terms of environmental, historical, cultural and socio-economic factors.

Sultan Qaboos University
Established in 1986, SQU is the only public university in Oman. The university consists of the following nine colleges:

(1) College of Agriculture and Marine Sciences.
(2) College of Medicine.
(3) College of Nursing.
(4) College of Engineering.
(5) College of Science.

(6)   College of Law.

(7)   College of Education.

(8)   College of Economics and Political Sciences.

(9)   College of Arts and Social Sciences.

Today, the university has 15,496 registered students and offers more than 68 Bachelor's degree courses, 59 courses at the Master's level and nearly 29 doctoral research programs, with more under consideration (SQU, 2011).

Education is provided free for all undergraduate students at SQU, covering tuition fees, textbooks, food and accommodation. The university provides various educational support centres to assist students' learning, such as the Centre for Educational Technology, the Language Centre and the Centre for Information Systems. The Language Centre plays a major role in preparing students to commence their higher education by providing intensive English language instruction. In addition, the university provides and supports various research centres and laboratories, such as those dedicated to water, environment, oil, telecommunications, remote sensing, earthquakes and seismology and Omani studies. In recent years, the university has also expanded substantially in terms of its physical facilities. Most notably, a cultural centre with a large multi-purpose hall and a large main library opened in 2010.

SQU has signed many collaborative agreements with regional and international universities and academic institutions. The university, with government support, has been targeting research productivity. In 2005, His Majesty Sultan Qaboos endorsed an annual grant of more than 1 million US dollars with the goal of enhancing the university's research output. This brings the current budget for research at the university to approximately 5 million US dollars per annum (SQU, 2012).

University college Dublin

UCD is recognized as a leading research university in Europe. Beginning in 1854 under the name of the Catholic University of Ireland, the university adopted its current name in 1881. The university's main campus is located 4 kilometres south of Dublin city centre at Belfield (UCD, 2012).

UCD has more than 30,000 students, with approximately 7,000 Master's students and 2,000 doctoral students. UCD is a leader in national research funding. The university has established four major research themes of specialty:

(1)   Earth Sciences, Energy and the Environment.

(2)   Health and Healthcare Delivery.

(3)   Information, Computation and Communication.

(4)   Global Ireland (UCD, 2012).

The university was recently recognized as one of the top 100 best universities in the world (according to the *Times Higher Education* rankings).

UCD has seven major colleges sub-divided into a different number of schools:

(1)   the College of Agriculture, Food Science and Veterinary Medicine;

(2)   the College of Arts & Celtic Studies;

(3)   the College of Business & Law;

(4)   the College of Engineering & Architecture;

(5)   the College of Health Sciences;

(6)   the College of Human Sciences; and

(7)   the College of Science.

The university also has a variety of multidisciplinary research institutes. Undergraduate tuition at UCD is free; although a registration fee was recently introduced.

Social networking technologies in scholarly communication

Although the body of literature examining the use of social networking tools for purposes of education and teaching – at both basic and higher education levels – is abundant (Veletsianos and Kimmons, 2012; Guy, 2012), there is less similar research that investigates the use of social networking technologies for scholarly communication (Gruzd et al., 2012). A comprehensive literature search yielded only a few empirical studies that investigated the use of social networking tools for informal scholarly communication (Gruzd et al., 2012; Chen and Bryer, 2012; Tiryakioglu and Erzurum, 2011; Letierce et al., 2010; Collins and Hide, 2010; Kirkup, 2010).

Research which specifically investigated the use of social networking tools for purposes of teaching, learning and teacher-student communication is well established (examples of recent studies are: Chen and Bryer, 2012; Thomas and Thomas, 2012; Tiryakioglu and Erzurum, 2011; Moran et al., 2011; Ebner et al., 2010; Lester and Perini, 2010; Liu, 2010; Roblyer et al., 2010). Course management systems, such as Blackboard, Moodle and WebCT, are sometimes grouped in this category.

Research studies report varying levels of academic use of social networking tools. A survey of 4,600 academics from American universities, for example, revealed low usage (80 per cent never used) of social networking tools (The Chronicle of Higher Education, 2010). By contrast, a recent study found that 80 per cent of surveyed academics used and maintained social networking sites of certain types (Procter et al., 2010). Chen and Bryer (2012) conducted telephone interviews with 57 academics from 28 universities in the USA and discovered that all of the participants used social networking tools for personal, academic, professional or research purposes.

The literature also cites differences in the use of social networking tools according to disciplinary differences. There is an inconsistency in the rate of adopting social networking tools between the science disciplines and those of the humanities and social sciences. For example, Maron and Smith (2008) point out that academics from science disciplines tend to adopt social networking tools earlier and more often than their counterparts from the humanities and social sciences, while another survey indicates that academics from science disciplines use social networking tools less frequently than scholars from the humanities and social science disciplines (Moran et al., 2011; Rowlands et al., 2011).

For purposes of research and scholarly communication, academics use social networking tools for exchanging information, building new connections and communicating with others for professional development (Chen and Bryer, 2012; Gruzd et al., 2012; Tiryakioglu and Erzurum, 2011). Specific tools, such as Twitter, have proved popular for frequent use by scholars to communicate with their counterparts and promote each other's work (Letierce et al., 2010). Scholars also use these tools to

make direct connections with their peers to stimulate new research ideas (Collins and Hide, 2010; Kirkup, 2010; Gruzd *et al.*, 2012).

Gu and Widén-Wulff (2011) recently investigated the changes affecting the information behaviour of academics in a social networked environment in Finland. Findings from their online survey reported familiarity with social networking tools among academics. The study also revealed a growing trend towards the use of social networking tools in the scholarly environment. Academics with greater knowledge and use of social media tools showed diversity in information practices, more opportunities for interactive communication and a wider cache of social networking tools at their disposal. The majority of the respondents agreed about the benefits of social networking tools in international and local collaboration with colleagues and other researchers, as well as for the communication of research.

Gruzd *et al.* (2012) similarly investigated how and why academics use social networking tools for communication and research practices in accordance with the unified theory of acceptance and use of technology (UTAUT) that aims to explain intentions to use a specific technology. They conducted semi-structured interviews with 51 participants who were members of the American Society of Information Science and Technology. Results revealed a strong uptake use of social networking tools for creating new connections and maintaining existing ones, collaborating, keeping well-informed about developments and promoting the dissemination of publications. Privacy was the only problem associated with the use of these tools in the academic setting (Gruzd *et al.*, 2012). The results also showed that the adoption rate of social networking tools is rapidly growing among researchers and university academics.

Rowlands *et al.* (2011) surveyed 2,000 researchers in an attempt to discover how researchers use social networking tools. Researchers grouped the social networking tools into six categories. Results suggested that researchers use at least two social networking tools in the research lifecycle, largely for collaborative authoring, conferencing and scheduling meetings. Procter *et al.* (2010) also found that social media technologies are transforming the pursuit of scholarship. They investigated how researchers from the UK have adopted social media services, including motivations and barriers to use and resulting work environment innovations. The researchers sent an e-mail survey to 12,000 academics and doctoral students. Of the 1,477 replies they received, only 13 per cent were identified as frequent users of social media tools for scholarly communication purposes, while the majority were either occasional users (45 per cent) or non-users (39 per cent). Findings further suggested that adoption was heavily influenced by collaborative research activities with different institutions. Semi-structured interviews were also conducted with 56 researchers to explore their practices and attitudes. Although social media tools have evolved rapidly, findings revealed only a modest adoption rate of these tools for scholarly communication purposes among UK researchers.

Research design
The current quantitative study focuses on the use of social networking tools for scholarly communication in the humanities and social science in two universities located in different countries. As outlined above, the two participating universities are similar in size and have many common disciplines.

To reach as many academics as possible in disciplines common to each university, a survey design was adopted. A survey has the advantage of canvassing attitudes across wider populations. The structure of the questionnaire consisted of sections that collected demographic data, frequency of usage, practices and attitudes, training, barriers and support. The content of the questionnaire followed a survey previously designed by Al-Aufi (2007) to investigate academics' use of networked information for research and scholarly communication at SQU. The design of the survey drew on recent studies relating to the use of social networking tools for informal scholarly communication. The survey was pre-tested by ten academics from both institutions for content, clarity and accuracy, and was then revised accordingly. The entire academic population across both universities was invited via e-mail to complete the final online survey. An online survey offered a cost-effective approach for wide distribution.

Respondents were academics from the College of Arts and Social Sciences and the College of Economics and Political Sciences at SQU with faculties or departments matched to similar scholarly groupings at the UCD, mainly from the College of Arts and the College of Human Sciences, for purposes of comparison. The total population size was 382 (236 from UCD and 146 from SQU). The academic rank of faculty members varied from post-doctoral positions or equivalent to professors.

Ethical considerations were reviewed by both universities where data collection took place. Data collection began in October 2012 and lasted one month. A link to the online survey was first e-mailed to the target population through grouped mailing lists for each school/department. A week later, follow-up individual e-mails with customized cover letters were sent to every academic member listed in the target groups. Two weeks later, reminders and follow-up customized e-mails were sent again. Collected data were exported to Statistical Package for the Social Sciences (SPSS) for analyses. Data were analysed with descriptive and inferential statistics used to compare survey responses.

Findings
Demographics
Of the total 382 target academics from schools/departments belonging to the humanities and social science disciplines at both UCD and SQU, 130 (34 per cent) academics responded to the online survey. Of the respondents, 78 respondents were from SQU and 52 respondents were from UCD.

The majority of the respondents to the survey were male (male: 70.8 per cent, $n = 92$; female: 29.2 per cent, $n = 38$). In terms of academic appointments, junior academics (lecturers and assistant professors) at both institutions represented the majority of the respondents to the survey (70 per cent, $n = 91$). It is also important to note that SQU does not provide post-doctoral appointments, as is common among most academic institutions in that region. The post-doctoral researchers who participated were from UCD (8.5 per cent, $n = 8$).

The majority of the respondents were aged below 40 years (39.2 per cent, $n = 51$), followed by those in their forties (28.5 per cent, $n = 37$). Such demographic features for the majority of the respondents would typically suggest a wider engagement with social networking tools.

Access and connectivity
Because acceptance and the use of social networking tools for general purposes have
expanded along with advances in networking and portable computing technologies,
discovering the types of portable computing tools academics used in connection with
social networking was important (see Table I).

The finding was roughly similar at both universities with the majority of the
respondents using notebooks (91 per cent, $n = 116$) more than other types of portable
computing devices. Smartphones were also popular among respondents (48.8 per cent,
$n = 62$) and more frequently used than tablet personal computers (22.8 per cent, $n = 29$).
There are, however, a few cases (3.1 per cent, $n = 4$) where desktop personal computers
were still chosen for social networking.

Adoption and use
Adoption and use of social networking tools for purposes of informal scholarly
communication are illustrated in Table II below.

The majority of the respondents reported that they use social networking tools for
informal scholarly communication (70.1 per cent, $n = 89$). However, almost one-third of
the respondents (29.9 per cent, $n = 54$) said they were non-users of these tools for
informal scholarly communication.

Findings in Table III illustrate that the majority of the respondents valued social
networking tools for informal scholarly communication to some degree. Those who

Type of portable computing device used in daily routine?	SQU N (%)	UCD N (%)	Total N (%)
Laptop, notebook, netbook, or ultra-book computer	71 (93.4)	45 (88.2)	116 (91.3)
Tablet (e.g. iPad, Galaxy tap, Kindle, Sony)	13 (17.1)	16 (31.4)	29 (22.8)
Smartphone device (e.g. iPhone, Galaxy, Nokia)	34 (44.7)	28 (54.9)	62 (48.8)
I do not use any of those mentioned above	2 (2.6)	2 (3.9)	4 (3.1)
Other (please specify)	0	0	0
Total (who responded to the question)	76	51	127

Table I.
Portable computing

Use versus non-use of social networking tools for informal scholarly communication	SQU N (%)	UCD N (%)	Total N (%)
Yes	54 (71.1)	35 (68.6)	89 (70.1)
No	22 (28.9)	16 (31.4)	38 (29.9)
Total	76	51	127

Table II.
Use versus non-use

Importance of social networking tools for informal scholarly communication	SQU N (%)	UCD N (%)	Total N (%)
Not important at all	0	3 (8.8)	3 (3.4)
Not very important	11 (20.4)	8 (23.5)	19 (21.6)
Important	27 (50)	16 (47.1)	43 (48.9)
Extremely important	16 (29.6)	7 (20.6)	23 (26.1)
Total	54	34	88

Table III.
Use value

reported using social networking tools rated these tools for informal scholarly communication as either important or extremely important (76 per cent, $n = 66$).

The majority of the respondents reported that they have been using these tools for purposes of informal scholarly communication for between one and three years. Nearly one-third of the respondents also stated that they have been using these tools for four to six years (see Table IV).

Social networking tools are constantly emerging. It is challenging to list all of the common types of these tools in one place. Therefore, it was decided that they should be grouped into seven categories by purpose and type of use as illustrated in Table V. It is also important to note that the literature does not provide standardized categorization of social networking tools. Table V also indicates the level and extant of use of these tools.

Findings of the summary data on the extent and level of use of social networking tools for both universities denoted that "social connections", such as Facebook, Twitter and Google+, were the social networking tools used most frequently by the respondents (mean = 3.34), followed by "cross-platform mobile applications," such as Skype and Whatsapp (mean = 2.95).

On the other hand, the summary data shows that the least frequently used social networking tools for informal scholarly communication were social bookmarking tools, such as Pinterest, Digg, Connotea and CiteULike (mean = 1.59), followed by blogging tools, such as WordPress, BlogSpot and Blogger (mean = 2.28).

A one-way analysis of variance (ANOVA) test was applied to determine whether there were significant differences between the group means on the use of social networking tools and the academic affiliation of the respondents. Findings indicated no significant differences at the 0.05 level for any of the categories listed in Table V. However, in this regard, the frequency distribution between the two academic settings was slightly different. Both SQU's and UCD's respondents reported using social connections, such as Facebook, Twitter and Google+, for informal scholarly communication; however, for "multi-media sharing" done through tools, such as YouTube and TED talks, the majority of the respondents from SQU used them "sometimes" (33.3 per cent, $n = 18$), while the majority from UCD never used them (34.4 per cent, $n = 11$). The majority of the respondents from SQU (26.9 per cent, $n = 14$) used cross-platform mobile applications, such as Skype and Whatsapp more frequently, whereas the majority of the respondents from UCD (78.6 per cent, $n = 11$) reported they never used them.

Users' activities and perceptions

A list of the informal scholarly communication activities and practices that are made possible through the use of social networking tools was adopted from the literature. A

Length of use of social networking tools for purposes of informal scholarly communication	SQU N (%)	UCD N (%)	Total N (%)
Less than a year	8 (14.8)	4 (12.5)	12 (14)
One to three years	23 (42.6)	18 (56.3)	41 (47.7)
Four to six years	17 (31.5)	8 (25)	25 (29.1)
More than six years	6 (11.1)	2 (6.3)	8 (9.3)
Total	54	32	86

Table IV.
Length of use

Level and extent of use of the following social networking tools for the purpose of informal scholarly communication		Never used (%)	Rarely (%)	Sometimes (%)	Often (%)	Always (%)
Social connections (e.g. Facebook, Twitter, Google+) (mean = 3.34)	SQU	5 (9.3)	6 (11.1)	18 (33.3)	14 (25.9)	11 (20.4)
	UCD	4 (12.1)	4 (12.1)	10 (30.3)	8 (24.2)	7 (21.2)
Multimedia sharing (e.g. YouTube, iTunes, Flickr, TED talks, Picasa, Instagram) (mean = 2.73)	SQU	10 (18.5)	7 (13)	18 (33.3)	15 (27.8)	4 (7.4)
	UCD	11 (34.4)	7 (21.9)	6 (18.8)	6 (18.8)	2 (6.3)
Professional (e.g. LinkedIn, Classroom 2.0) (mean = 2.71)	SQU	6 (12.2)	16 (32.7)	14 (28.6)	9 (18.4)	4 (8.2)
	UCD	5 (15.2)	12 (36.4)	9 (27.3)	4 (12.1)	3 (9.1)
Academic (e.g. Academia.edu, SlideShare) (mean = 2.55)	SQU	14 (28)	10 (20)	13 (26)	10 (20)	3 (6)
	UCD	9 (29)	9 (29)	4 (12.9)	5 (16.1)	4 (12.9)
Blogging (e.g. WordPress, BlogSpot, Blogger) (mean = 2.28)	SQU	18 (35.3)	15 (29.4)	10 (19.6)	3 (5.9)	5 (9.8)
	UCD	10 (31.3)	9 (28.1)	6 (18.8)	6 (18.8)	1 (3.1)
Social bookmarking (e.g. Pinterest, Digg, Connotea, CiteULike, SocialMarker.com) (mean = 1.59)	SQU	26 (52)	15 (30)	8 (16)	0 (0)	1 (2)
	UCD	22 (71)	7 (22.6)	1 (3.2)	0 (0)	1 (3.2)
Cross-platform mobile apps (e.g. Whatsapp, Viber, Skype, Tango) (mean = 2.95)	SQU	12 (23.1)	4 (7.7)	13 (25)	14 (26.9)	9 (17.3)
	UCD	11 (78.6)	1 (7.1)	0 (0)	2 (14.3)	0 (0)

Table V.
Level and extent of
use

five-point frequency scale was chosen to measure the frequency of use of these activities or practices by the respondents to the survey.

According to group mean scores of each activity, as presented in Table VI, results showed that the highest mean score was recorded for the respondents' use of social networking tools "to communicate with academics or researchers globally" (mean = 3.17), followed by their use for learning about conference announcements (mean = 3.04) and "to keep current in an area of research" (mean = 3.01). Using social networking tools to communicate with publishers was recorded as the least frequently practised activity (mean = 2.30).

A one-way ANOVA test was applied to determine whether there were significant differences between the group means of these activities and the academic affiliations of the respondents. Findings presented statistical significance at the 0.05 level for respondents from SQU in two particular activities, "communicating with academics and researchers at the same institution" and "communicating with publishers". The rest of the activities, however, showed no statistical significance at the determined level of 0.05, despite the fact that descriptive data pointed out slight differences for certain activities.

Impact of use (perceived usefulness)

A Likert scale was used to measure the level of perceived usefulness of social networking tools for informal scholarly communication.

Descriptive findings about perceived usefulness of social networking tools (see Table VII) reveal an overall positive level of agreement on the impact of social networking tools on informal scholarly communication. The highest mean score was recorded for the enjoyment associated with using social networking tools (mean = 3.90), followed by the advantages that social networking tools offer to the respondents to work beyond geographical boundaries (mean = 3.87), and the impact that these tools deliver for widening scholarly communities of the respondents (mean = 3.76). The lowest mean score in Table VII was recorded for the level of dependence on social networking tools for purposes of scholarly communication (mean = 3.11), followed by impact of social networking tools on improving the quality of respondents' research (mean = 3.32).

A one-way ANOVA test was used to find out whether there are significant difference between the group means of these activities and the academic affiliations of the respondents. Findings indicated no statistical significance at the 0.05 level for all of the statements presented in Table VII.

Barriers to adoption

Out of the total 130 academics who responded to the survey, almost one-third (29.9 per cent, $n = 38$) indicated an absolute non-use of social networking tools for informal scholarly communication. A list of barriers was suggested for the respondents to choose from, with a survey option offering respondents the opportunity to identify other barriers and challenges to informal scholarly communication. Table VIII presents an overall data summary about the findings from that question.

Every listed suggestion represents a potential challenge or a barrier for respondents (see Table VIII). Lack of university encouragement or incentives were reported as the most challenging issue (34.2 per cent, $n = 39$), followed by concerns about adequate security on the Internet (30.7 per cent, $n = 35$), lack of digital literacy (25.4 per cent, $n = 29$) and lack of adequate training (24.6 per cent, $n = 28$). The complexity of using

Frequency of use of social networking tools for the following informal scholarly communication activities		Never used (%)	Rarely (%)	Sometimes (%)	Often (%)	Always (%)
To communicate with academics or researchers at same institution (mean = 2.82)	SQU	6 (11.3)	13 (24.5)	12 (22.6)	18 (34)	4 (7.5)
	UCD	7 (21.9)	11 (34.4)	7 (21.9)	5 (15.6)	2 (6.3)
To communicate with academics or researchers at different institutions with same country (mean = 2.80)	SQU	9 (17)	12 (22.6)	15 (28.3)	14 (26.4)	3 (5.7)
	UCD	4 (13.3)	7 (23.3)	12 (40)	5 (16.7)	2 (6.7)
To communicate with academics or researchers regionally (mean = 2.879)	SQU	7 (13.2)	17 (32.1)	12 (22.6)	12 (22.6)	5 (9.4)
	UCD	5 (16.7)	3 (10)	12 (40)	8 (26.7)	2 (6.7)
To communicate with academics or researchers globally (mean = 3.17)	SQU	4 (7.7)	12 (23.1)	17 (32.7)	13 (25)	6 (11.5)
	UCD	2 (16.1)	6 (18.2)	8 (24.2)	14 (42.4)	3 (9.1)
To exchange documents or information about issues or topics in an area of research (mean = 2.92)	SQU	9 (17)	11 (28.8)	16 (30.2)	11 (28.8)	6 (11.3)
	UCD	4 (12.5)	7 (21.9)	9 (28.1)	9 (28.1)	3 (9.4)
To provide or obtain updates on research (mean = 2.872)	SQU	9 (17)	11 (20.8)	14 (26.4)	15 (28.3)	4 (7.5)
	UCD	5 (15.2)	8 (24.2)	9 (27.3)	9 (27.3)	2 (6.1)
To ask questions or provide answers (mean = 2.91)	SQU	7 (13.2)	8 (15.1)	21 (39.6)	13 (24.5)	4 (7.5)
	UCD	5 (15.2)	8 (24.2)	10 (30.3)	8 (24.2)	2 (6.1)
To keep current in an area of research (mean = 3.01)	SQU	6 (11.3)	11 (20.8)	16 (30.2)	11 (20.8)	9 (17)
	UCD	4 (12.1)	9 (27.3)	9 (27.3)	10 (30.3)	1 (3)
To learn about conference announcements (mean = 3.04)	SQU	6 (11.3)	9 (17)	17 (32.1)	15 (28.3)	6 (11.3)
	UCD	3 (9.1)	9 (27.3)	9 (27.3)	11 (33.3)	1 (3)
To communicate with publishers (mean = 2.30)	SQU	12 (22.6)	12 (22.6)	13 (24.5)	11 (20.8)	5 (9.4)
	UCD	18 (54.5)	12 (36.4)	0 (0)	3 (9.1)	0 (0)

Table VI.
Informal scholarly communication activities

Level of agreement to the following statements		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I enjoy using social networking tools. (mean = 3.90)	SQU	0 (0)	1 (1.9)	9 (17)	29 (54.7)	14 (26.4)
	UCD	1 (2.9)	3 (8.8)	10 (29.4)	12 (35.3)	8 (23.5)
Social networking tools make it easier for me to research collaboratively. (mean = 3.60)	SQU	0 (0)	5 (9.4)	13 (24.5)	28 (52.8)	7 (13.2)
	UCD	1 (2.9)	5 (14.7)	10 (29.4)	13 (38.2)	5 (14.7)
Social networking tools help me access new tools for my research. (mean = 3.53)	SQU	0 (0)	4 (7.5)	17 (32.1)	23 (43.4)	9 (17)
	UCD	3 (9.1)	8 (24.2)	4 (12.1)	13 (39.4)	5 (15.2)
Social networking tools provide me with the capabilities to easily work beyond geographical boundaries. (mean = 3.87)	SQU	0 (0)	2 (3.8)	14 (26.9)	22 (42.3)	14 (26.9)
	UCD	1 (2.9)	2 (5.9)	9 (26.5)	13 (38.2)	9 (26.5)
Social networking tools help me establish new relations with other researchers. (mean = 3.73)	SQU	0 (0)	2 (3.8)	11 (20.8)	29 (54.7)	11 (20.8)
	UCD	1 (3)	5 (15.2)	10 (30.3)	13 (39.4)	4 (12.1)
The use of social networking tools improves the quality of my research. (mean = 3.32)	SQU	1 (1.9)	7 (13.2)	15 (28.3)	23 (43.4)	7 (13.2)
	UCD	4 (11.8)	5 (14.7)	12 (35.3)	13 (38.2)	0 (0)
Social networking tools widen the scholarly community with which I am in contact. (mean = 3.76)	SQU	0 (0)	2 (4)	17 (34)	21 (42)	10 (20)
	UCD	2 (5.9)	1 (2.9)	6 (17.6)	20 (58.8)	5 (14.7)
I have been increasingly dependent on social networking tools for purposes of informal scholarly communication. (mean = 3.11)	SQU	3 (5.7)	11 (20.8)	17 (32.1)	18 (34)	4 (7.5)
	UCD	4 (11.8)	7 (20.6)	10 (29.4)	10 (29.4)	3 (8.8)

Table VII.
Perceived usefulness

Barriers to adoption of social networking tools for informal scholarly communication	SQU N (%)	UCD N (%)	Total N (%)
Lack of digital literacy	20 (28.2)	9 (20.9)	29 (25.4)
Lack of adequate training	21 (29.6)	7 (16.3)	28 (24.6)
Lack of confidence	15 (21.1)	6 (14.0)	21 (18.4)
Lack of university encouragement and incentives	28 (39.4)	11 (25.6)	39 (34.2)
Lack of essential software or hardware	12 (16.9)	4 (9.3)	16 (14.0)
Lack of adequate security on the Internet	21 (29.6)	14 (32.6)	35 (30.7)
The Internet policy use is limited and restricted	26 (36.6)	1 (2.3)	27 (23.7)
Complexity of using the technology	12 (16.9)	2 (4.7)	14 (12.3)
Other (please specify)	12 replies	21 replies	33 replies
Total (who responded to the question)	71	43	114

Table VIII.
Barriers to adoption

technology was seen as the least challenging issue (12.3 per cent, $n = 14$), followed by the lack of essential software or hardware (14 per cent, $n = 16$).

Findings for this particular question were then filtered to differentiate the responses of non-users from users of social networking tools for informal scholarly communication. As indicated earlier, the total of non-users was 38; 22 were from SQU and 16 from UCD. The majority of those respondents (59.5 per cent, $n = 22$) chose "other" challenges, barriers and rationales for non-use. Respondents' comments revealed additional concerns around relevancy of social networking tools for scholarly communication, as well as lack of interest in social networking tools. The majority of these concerns focused on the lack of value (11 respondents) of these tools for informal scholarly communication.

Discussion

Respondents realized the potential and perceived advantages of using social networking tools for informal scholarly communication. Almost 75 per cent considered these tools as important, or extremely important, for informal scholarly communication. In addition, almost half of the respondents have been using these tools for the past three years. These findings indicate that social networking tools are becoming essential for researchers to collaborate, exchange and develop research ideas, create new ties and promote their research.

In terms of frequency of use of these tools for informal scholarly communication, social connection tools, such as Facebook, Twitter and Google+, were found to be the most frequently used (mean = 3.34), while social bookmarking tools were the least regularly used for informal scholarly communication (mean = 1.59). Social connection applications, such as Facebook and Twitter, were very common among users of all types, because these tools responded faster to changing needs and motivated the behaviour of users.

Respondents reported using social networking tools for communication and collaboration with peers and other academics or researchers internationally (mean = 3.17) more often than on a local or regional basis. This can be explained by the universities' policies of encouraging collaboration in research at international levels. These policies allowed for the expansion of scholarly communities, as well as speedy dissemination of research.

There is a relatively positive level of agreement among respondents on the perceived usefulness and advantages of social networking tools for informal scholarly communication. The majority of the respondents agreed or strongly agreed that these tools were enjoyable to use (mean = 3.90), eliminated geographical barriers (mean = 3.87), widened the scholarly community (mean = 3.76), helped to establish new relations (mean = 3.73) and eased research collaboration (mean = 3.60).

Among the challenges perceived and difficulties associated with the use of social networking tools for informal scholarly communication were concerns about the lack of encouragement, security, digital literacy and training. Non-adopters generally considered these tools irrelevant to scholarly communication.

In terms of institutional differences between SQU and UCD, the overall findings of this study showed no significant differences in the adoption of social networking tools and their impact on the academics' patterns of informal scholarly communication, except for a few instances in which respondents from SQU used social networking tools

more regularly than respondents from UCD to communicate with academics and researchers at the same institution and with publishers. This finding may be associated with the similar academic structures and international composition of both universities.

Although a body of research around the use of social networking tools for scholarly communication is slowly emerging, some important studies have supported the findings in the current study. Gu and Widén-Wulff (2011) have reported that academics are becoming familiar with social networking tools and adoption is increasing. In line with the current study, Gu and Widén-Wulff (2011), Gruzd *et al.* (2012) and Rowlands *et al.* (2011) have all indicted that respondents perceived advantages of the potential of social networking tools on both local and global research collaboration. By contrast, the findings of Tiryakioglu and Erzurum (2011) and Procter *et al.* (2010) have indicated that adoption of these tools was slightly low.

Limitations

Data collection was limited to academics affiliated with departments/colleges in the humanities and social sciences that are common to both SQU and UCD. Given that the number of study respondents was small (total = 382) and that academics by their very nature are disinclined to respond to online surveys, results of the study may suggest non-response errors. These may have impacted negatively on the acceptability of inferences and statistical conclusions. The results of the study are, therefore, unlikely to be useful for generalization, but they remain suggestive of a growing tendency among humanities and social sciences' academics to use social networking tools for informal scholarly communication.

The reproduction of the study in different contexts in both developing and developed countries would allow better generalizability of the findings. Moreover, research with a larger subject representation and better response rate would ensure more generalizable conclusions. A future qualitative research design might also add an in-depth perspective on reasons for adoption or non-adoption to the current research.

Future research and conclusion

This cross-institutional study investigated the use of social networking tools for informal scholarly communication by academics in the humanities and social sciences disciplines at two universities with different contexts. The major findings of the current study have suggested that the use of social networking tools is gaining acceptance and popularity among academics in the humanities and social sciences disciplines with almost two-thirds of the respondents from both universities indicating some sort of use of these tools for informal scholarly communication.

Social networking tools are very likely to continue to draw the attention of academics in the near future as portable computing and networking technology continue advancing rapidly. From a methodological perspective, interviewing academics for future research may help provide additional evidence and extend understanding to determine the potential of social networking tools for scholarly communication. Using other research techniques, such as case studies or focus groups, might also increase understanding of academics' perceptions, experiences and use of social networking tools for scholarly communication. Moreover, future research might also explore interdisciplinary differences with particular emphasis on the use of very common social networking tools, such as Facebook and Twitter.

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