

Health 2.0: The scholarly communication practices of Medical Sciences and Health  
Sciences users on Academia.edu

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### Abstract

Many academics are active users of social media and some even use these sites for professional networking. However, while scholars can use traditional social networking platforms to network with their peers, share research articles, and keep up to date in their fields, there are some limitations that emerge when these sites are used for academic purposes. Academic social networking sites have emerged as one viable alternative, as they allow scholars to share their research and to network and collaborate with others while maintaining a professional online presence. Although many studies have examined the information behaviour of those who use academic social networking sites, such as differences in discipline and academic status, no studies to date have explored these characteristics in the health and medical field. This study seeks to address this gap by focusing on the scholarly communication practices of faculty members and graduate students in two disciplines – Medical Sciences and Health Sciences – on Academia.edu.

*Keywords:* academic social networking, scholarly communication, medical sciences, health sciences, Academia.edu

Health 2.0: The scholarly communication practices of Medical Sciences and Health Sciences users on Academia.edu

Web 2.0 has had a drastic impact on the scholarly communication landscape. Scholars are increasingly expected to have a professional online presence and are using popular social media sites,<sup>1</sup> such as Facebook and Twitter, to share their research and to network and collaborate with others (Jeng, He, & Jiang, 2015). In one study conducted by Procter et al. (2010), the authors found that 80% of academics had a social media account, while 13% of scholars reported using social media in novel forms of scholarly communication. For example, a few studies have examined how Twitter allows scholars to follow sessions and topics covered at academic conferences and the relationship between sharing research on social media and citation counts (Letierce, Passant, Breslin, Decker, 2010; Weller, Dornstädter, Freimanis, Klein, & Perez, 2010; Weller & Puschmann, 2011).

However, although traditional social media sites are popular amongst academics and can be used for building scholarly networks, many scholars only use social media sites for personal use. Studies on how faculty and students use Facebook, for example, suggest that faculty are less likely to use this social networking site for educational purposes (Roblyer, McDaniel, Webb, Herman, & Witty, 2010), although some scholars occasionally use their Facebook profiles to announce new articles (Kortelainen & Katvala, 2012; Priem, Groth, & Taraborelli, 2012). In fact, there are some limitations that emerge when these sites are used for academic networking. A number of scholars have expressed a perceived loss of personal privacy while using these networks, while others

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<sup>1</sup> I use social media and social networking sites interchangeably to mean sites which allow users to create a profile and make connections with others (Ellison, 2007)

have reported difficulties maintaining boundaries between their personal and professional lives (Gruzd, 2012). As a result, many academics have multiple social media accounts in order to achieve a better work-life balance (Gruzd, 2012).

## **Literature Review**

### **Academic Social Networking Sites**

Academic social networking sites, or social media sites designed specifically for scholars, have emerged as one alternative to traditional social networking services (Gruzd, 2012). Some examples of popular academic social networking sites include Academia.edu, Mendeley, ResearchGate, and LinkedIn. After joining one of these sites, users are encouraged to create a research profile, add contacts, search for members with similar research interests, create and/or join groups, and participate on discussion boards. Members can also consult a news feed that updates them on the latest uploaded papers and comments from others in their network (Oh & Jeng, 2011; Krause, 2012). A few academic social networking sites, such as Mendeley and Zotero, also offer bibliographic management tools to help scholars manage their documents and citations (Jeng, He, & Jiang, 2015).

### **Academic Social Networking Sites & Research Impact**

One major research focus for academic social networking services is related to bibliometrics and altmetrics. Traditionally, research impact and visibility have been measured by counting publications and citations in the scholarly literature – a method known as bibliometrics (Roemer & Borchardt, 2012). However, citation metrics are not a perfect way to measure research impact. For instance, there is often a latency period, as it can take one to two years or longer to accumulate citations for a given publication

(Brody, Harnad, & Carr, 2006). Also, the most popular citation counting metric, the Thomson Scientific's Journal Impact Factor, has been criticized for failing to measure impact at the article level and for being arbitrary, hard to replicate, and easy to manipulate (Seglen, 1994; Rossner, Van Epps, & Hill, 2007; Falagas & Alexiou, 2008).

Although citation counts and h-index still remain important indicators of academic success today, with an increasing number of scholars who are visible on the Web, non-traditional metrics have evolved as another way to measure research impact. These alternative metrics, or altmetrics for short, are used to determine other important impact factors, such as article views, downloads, or if the work is mentioned on social media (Priem, Taraborelli, Groth, & Neylon, 2010). Academic social networking sites, including Academia.edu and ResearchGate, employ altmetrics that allow scholars to track their profile and document views, total publications, total impact points, and downloads. Altmetrics are also increasingly being considered in the tenure and promotion process, as they offer the potential for fuller assessments of a researcher's output (Gruzd, Staves, & Wilk, 2011; Espinoza Vasquez & Caicedo Bastidas, 2015).

### **Academic Social Networking Sites & Scholarly Communication**

However, beyond allowing researchers the ability to track the discussion and attention garnered by their work, academic social networking sites are now formally playing a role in the scholarly communication process. Scholarly communication can be defined as “the system through which research and other scholarly writings are created, evaluated for quality, disseminated to the scholarly community, and preserved for future use” (ACRL, 2015). The introduction and subsequent success of academic social networking sites, such as ResearchGate, Academia.edu, and LinkedIn, have changed the

way in which scholars connect, collaborate, and disseminate their research (Greenhow, 2009; Weintraub, 2012; Zaugg, West, Tateishi, & Randall, 2010). Many of these more professionally marketed social media sites encourage members to list their documents on their profiles and even give users the option of uploading their manuscripts and preprints. This process, in which the author deposits a free copy of an electronic document online in order to make it accessible, is known as self-archiving or green open access (Harnad, 2001). The term generally refers to the self-archiving of peer-reviewed research papers, conference articles, theses, and book chapters into a university's institutional repository or into an open archive, such as on ResearchGate, Mendeley, or Academia.edu.<sup>2</sup> This practice differs from gold open access where scholarship is made publicly and freely available online in an open access journal (Harnad et al., 2004; Suber, 2007). Users of these sites are then encouraged to share their research with their scholarly network or with the broader (and often worldwide) academic community via traditional social media sites (i.e. Twitter). Such examples suggest that academic social networking sites are also being used as a venue for scholarly communication.

There are a number of incentives for scholars to upload their research to these sites. Authors benefit from increased visibility and research impact, as those who choose to make their work open access are downloaded and cited more frequently than those who opt for more conventional publishing routes (Davis, 2010; Hitchcock, 2004; Swan, 2010). There is also more opportunity for collaboration with other researchers in the field (Darling, Shiffman, Côté, & Drew, 2013). Some studies have even compared

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<sup>2</sup> Uploading documents to an academic social networking site, such as ResearchGate, Mendeley, or Academia.edu, is not the same as depositing a work into a university's institutional repository because 1) users need to create an account in order to access the documents and 2) there is no guarantee of long-term preservation on these sites.

participation on academic social networking sites to networking at conferences, as they facilitate and supplement a researcher's professional network (Curry, Kiddle, & Simmonds, 2009; Kelly, 2013; Nentwich, 2010; Codina, 2009). Other benefits include greater transparency with research funds and grants, increased creativity and innovation, and improved education for all (SPARC, 2016). This last advantage is especially apparent in the health and medical field. Access to health related research aids health care practitioners and patients, especially in developing countries, where limited funds make it hard for health care professionals to stay up to date with the latest medical information (Grouse, 2014). Greater access to reliable medical information is needed to prevent disease and to improve health care in countries all over the world.

But are scholars actually using academic social networking sites to share their research and to network and collaborate with others? A study by Jordan (2014) revealed that most scholars on academic social networking sites view their profiles as an 'online business card' or curriculum vitae, rather than as a site for active interaction with others. However, participants did like the concept of using the site to promote their research, particularly junior researchers (Jordan, 2014). A more recent study conducted by Jeng, He, and Jiang (2015) found contradictory results. The authors examined user participation on the academic social networking site Mendeley. While the majority of participants reported using the site for its research features, or as a document or citation management tool, many members also used Mendeley to manage their academic contacts and to expand their professional networks. There is also evidence to suggest that researchers are using academic social networking sites to find scholars with similar research interests to their own and to keep up to date in their fields. Results from a survey

of physicists, linguists, and sociologists on Academia.edu, for example, showed that these academics are using the site to read articles posted by other researchers. Participants also searched for members with similar research interests to their own (Megwalu, 2015).

These studies suggest that academic social networking sites are platforms where both formal and informal scholarly communication occur, creating a unique space to study existing and emerging communication behaviours.

### **Information Behaviour of Users**

So, scholars are using academic social networking sites for scholarly communication- but who is using these sites? Fortunately, several studies have tried to address this question by examining the academic status of those who use academic social networking sites. For example, a study by Jordan (2014) investigated the impact of academic seniority on network structure on Academia.edu. Results of the study indicated that a user's number of connections and position within the network was dependent on academic seniority. Senior academics tended to have more connections and a more prominent position within the network in comparison to junior researchers. Professors also had a stronger tendency to only follow people who they knew personally in real life and were less likely to try and make new connections on the site. In other words, professors enjoyed a privileged position within the network, even though they were not actively trying to network as much as students.

However, it is possible that this advantage is not due to academic seniority, but to a higher user group activity. In a study by Megwalu (2015), students were more likely to register on Academia.edu, but post-docs and faculty members had the highest number of logins over a ten-month period, making them more frequent users than students. In

another study conducted by Thelwall and Kousha (2014), the authors discovered that students tended to list more interests than faculty, but that faculty listed more books and papers and were cited more often than students. Also, senior researchers received substantially more document views and profile views than junior researchers. This study confirms previous research by Almousa (2011), where faculty were found to be more active and uploaded more documents than any other group in all three disciplines studied.

While a few studies have examined academic status, other research has been more focused on disciplinary differences in the use of academic social networking sites. For example, in a study by Megwalu (2015), the author looked at physicists, linguists, and sociologists on Academia.edu and found that linguists and sociologists were more likely to join the site than physicists. This finding is supported in the literature, as humanists heavily populate Academia.edu and researchers from the humanities and social sciences are more active than any other user group on the site (Ortega, 2015; Thelwall & Kousha, 2014; Almousa, 2011). In contrast, computer and information scientists tend to be heavier users of Google Scholar Citations and scientists, particularly biologists, are more likely to have an account on ResearchGate (Ortega & Aguillo, 2012; ResearchGate, 2016). These differences in use can be attributed to variations in the socio-cultural practices of these disciplines (Megwalu, 2015).

However, while studies on academic social networking sites and disciplinary differences are common, very little research has examined the scholarly communication practises of health and medical researchers on these sites. In one study conducted by Oh and Jeng (2011), the authors looked at participation in Mendeley groups by discipline. Results of the study showed that Medicine was the third largest member group and had a

high level of group member participation. In another more recent study by Mohammadi, Thelwall, Haustein, and Larivière (2015), the authors found that non-academics (medical professionals) read more clinical medicine articles on Mendeley than academics. More research is needed, however, in order to see whether scholars in the health and medical field are using academic social networking sites for scholarly communication. To address these gaps that persist in the literature, this study seeks to answer the following research questions by focusing on two disciplines – Medical Sciences and Health Sciences – on Academia.edu:

R1: Is there a correlation between academic seniority and user activity (# of listed documents) on Academia.edu?

R2: Is there a relationship between academic seniority and altmetrics score (# of profile views, # of followers) on Academia.edu?

R3: Are there disciplinary differences in use between Medical Sciences and Health Sciences?

## **Method**

### **Academia.edu**

Academia.edu was chosen as the academic social networking site for this study as the site has more academic profiles than any other academic social networking service and is currently the most popular amongst academics (Ortega, 2015). The site was first launched in September 2008 and currently has more than 37 million registered users and over 12 million uploaded texts (Academia.edu, 2016). Furthermore, its content is cited more often than articles posted on other academic social networking sites (Thelwall & Kousha, 2014). Academia.edu allows members to create their own profiles. On these profile pages, users have the option of listing their publications (books, talks, papers) and research interests (a list of keywords), along with their name, a picture, academic status, and affiliation information (See *Figure 1*). Anyone who views a member's profile is able

to see this information as well as a set of metrics, detailing the user's number of followers and profile views. It is also possible to see how many documents a user has listed on their profile. This information formed the source of raw data for the study.

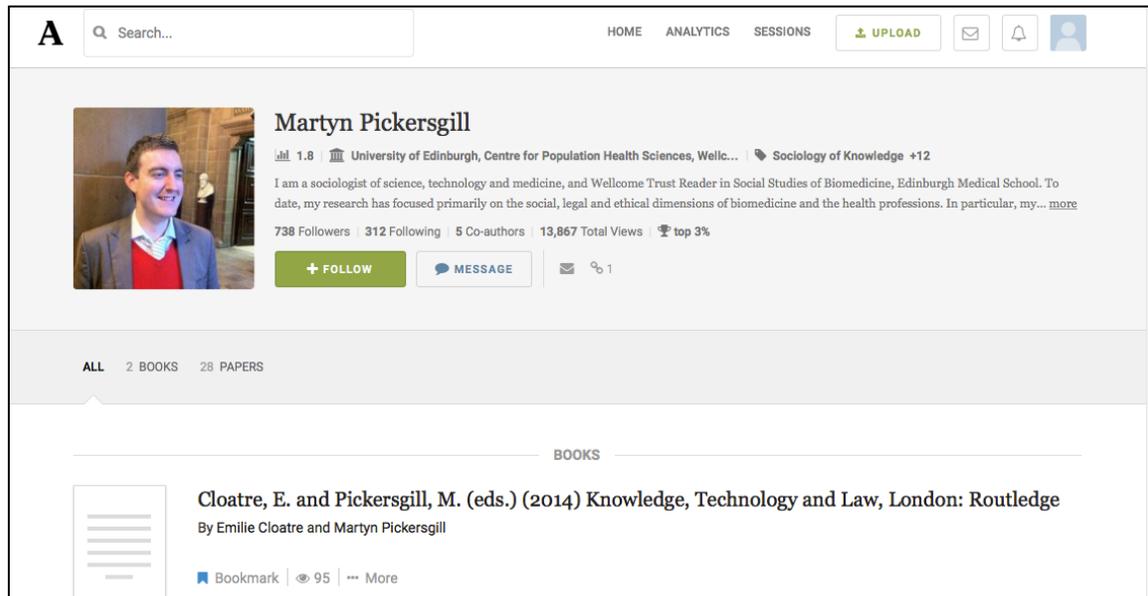
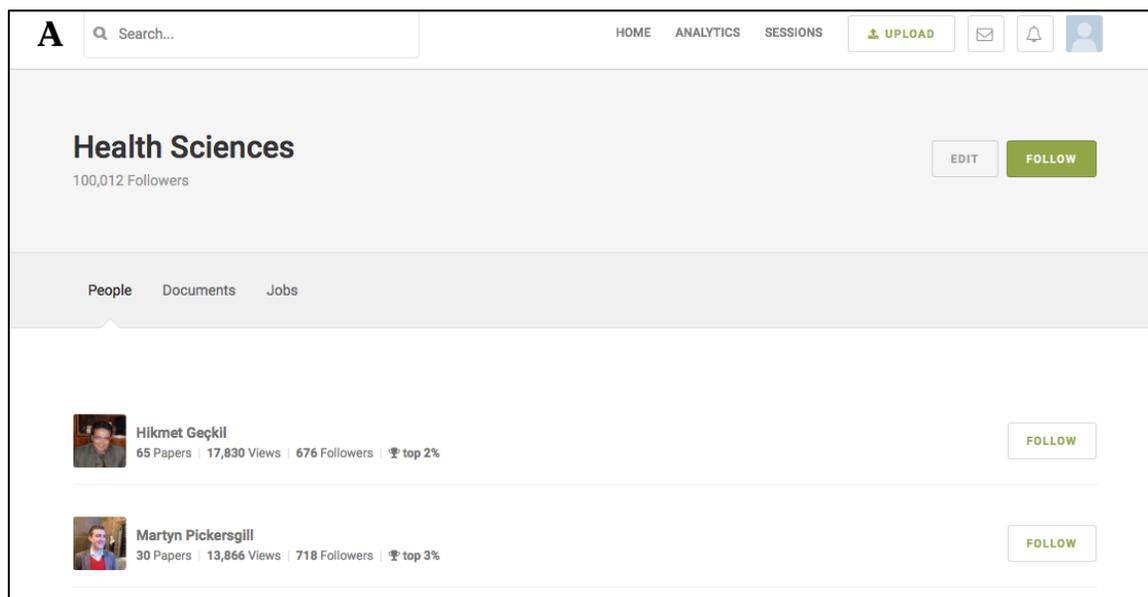


Figure 1. The profile page of a Health Sciences user on Academia.edu.

The study focused on two research areas for data collection purposes on Academia.edu. These two subject areas – Medical Sciences and Health Sciences – were chosen because they are broad in nature and include multiple disciplines (for example, Health Sciences also includes Nursing, Public Health, Pharmacy, etc.). Currently, Academia.edu does not allow researchers to harvest data from their site, as they have outlawed the use of web crawlers and other related tools that would allow researchers to download collective content. Therefore, for R1 and R2, data was collected manually from the People section of each research interest webpage – Medical Sciences (36, 255 members) and Health Sciences (89, 937 members). The People section of each research interest page includes all members who list the discipline as a research interest and information about the researcher- including their name, academic position, and their total

number of publications, profile views, and followers (See *Figure 2*). A fake profile was generated for data collection purposes in order to see the number of profile views, number of documents, and number of followers for each participant on the respective research interest page.



*Figure 2.* The People section of the Health Sciences research interest page- the People section includes all members who list Health Sciences as a research interest.

When registering for an account on Academia.edu, users have the option of choosing their academic status from the following pre-existing categories: faculty member, post-doc, graduate student, adjunct, emeritus/emerita, undergraduate, and alumnus/alumna or entering in their own. These self-identified statuses were used to determine academic seniority. Members with an unclear academic status (i.e. researcher) were omitted from the study. To identify genuine researchers, as opposed to those who merely listed Medical Sciences or Health Sciences as a research interest, only those with an affiliation (usually a department) related to the discipline were retained for data analysis. Members with conflicting cross appointments (i.e. Medical Sciences faculty

members who were listed on the Health Sciences research interest page) were omitted from the study, as were researchers who listed multiple research interests. This decision was based on the assumption that a researcher who lists multiple interests may be listing Medical Sciences or Health Sciences as a casual interest along with other areas.

The most common academic status amongst Medical Sciences users (n=381) was faculty members (234), followed by graduate students (79), post-docs (39), undergraduate students (10), adjuncts (8), alumni (7), and emeritus (4) respectively. For Health Sciences (n= 383), similar results were found, with the top three user categories being faculty members (234), graduate students (100), and post-docs (23) before alumni (12), undergraduates (10), and adjuncts (4). Only two categories, faculty members and graduate students, were retained for further analysis, as there was insufficient data for comparison between the other groups. The RANDBETWEEN function in Excel was used to generate a random representative sample for each group (n=40) to allow for comparison between faculty and graduate students. For R3, the researcher analyzed the results of R1 and R2 in order to compare the two disciplines.

## **Results**

### **Faculty Members and Graduate Students**

Overall, faculty members were the most active user group on Academia.edu. In both Medical Sciences and Health Sciences, more faculty members than graduate students registered for an account on Academia.edu (See *Figure 3 & Figure 4*). Faculty members also added significantly more documents to their profiles than did graduate students in both Medical Sciences and Health Sciences (See Table 1).

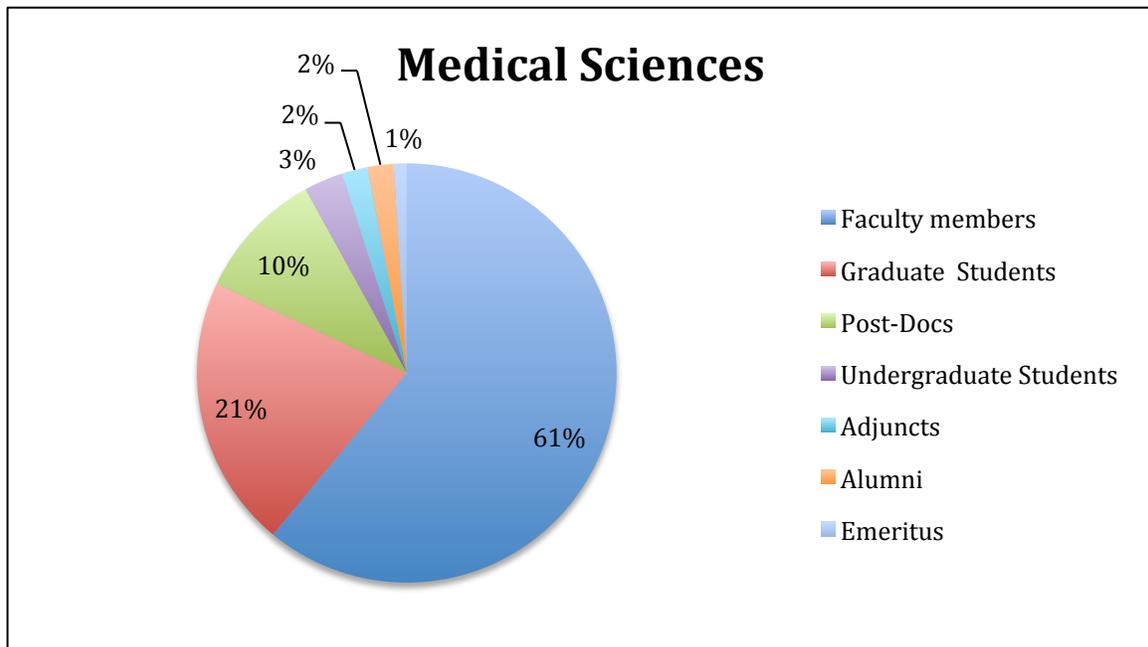


Figure 3. Percentage of Medical Sciences users on Academia.edu by academic status.

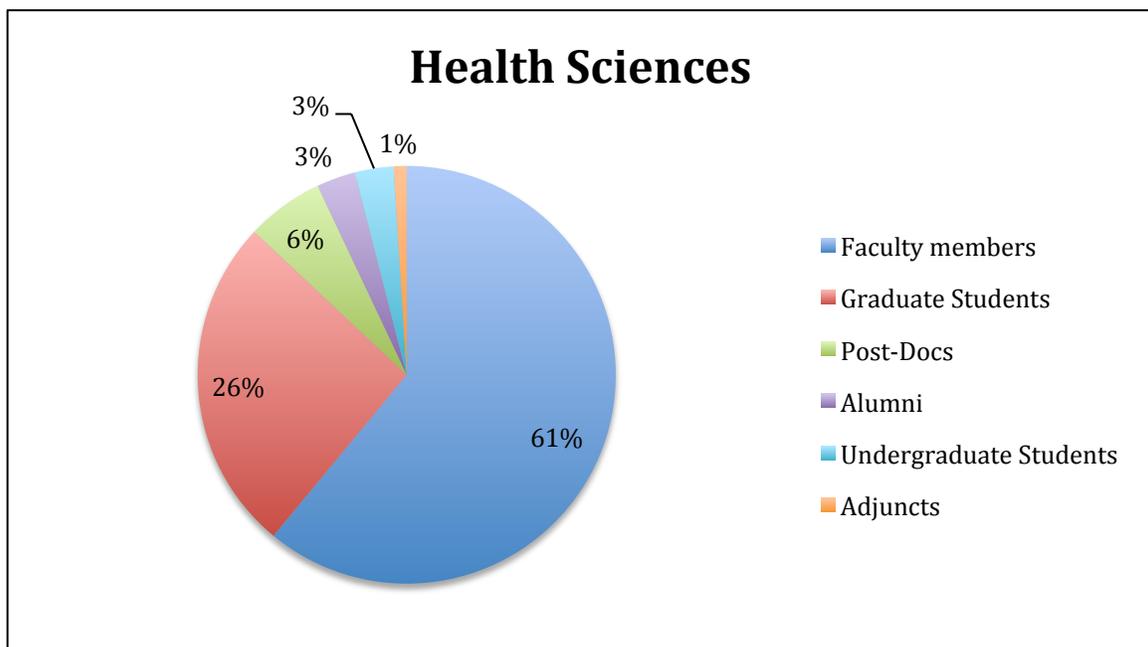


Figure 4. Percentage of Health Sciences users on Academia.edu by academic status.

Table 1

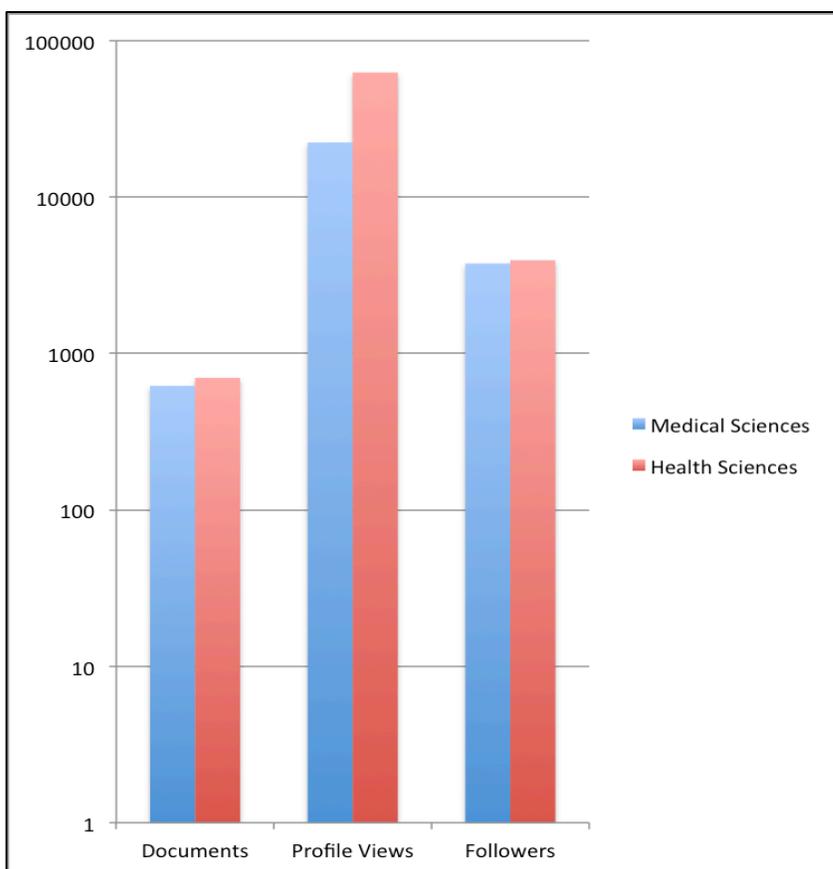
*Number of documents, profile views, and followers for Faculty and Graduate Students in Medical Sciences and Health Sciences on Academia.edu*

Mean (n=160)	Documents Listed	Profile Views	Followers
Medical Sciences Faculty (n= 40)	548 <b>13.7</b>	9614 <b>240.35</b>	1625 <b>40.63</b>
Medical Sciences Grad (n= 40)	73 <b>1.83</b>	12 734 <b>318.35</b>	2140 <b>53.5</b>
Health Sciences Faculty (n= 40)	563 <b>14.08</b>	54 139 <b>1353.48</b>	2937 <b>73.43</b>
Health Sciences Grad (n= 40)	136 <b>3.4</b>	8494 <b>212.35</b>	1010 <b>25.25</b>

However, despite being more active on the site, faculty members did not necessarily enjoy a more privileged position within the network. While Health Sciences faculty had significantly more profile views and followers than graduate students, Medical Sciences graduate students had more profile views and followers than faculty members. Also, the number of documents listed on a user's profile page had little bearing on the number of profile views and number of followers that they received. For both disciplines, only low correlations were found between the number of documents listed on a member's profile and their number of profile views and followers with one notable exception. A strong correlation (+0.8) was found between the number of documents listed on Medical Sciences graduate student profiles and the number of profile views that these students received. Thus, it is beneficial for Medical Sciences graduates to add documents to their profiles, as doing so will likely result in an increase in profile views.

### Disciplinary Differences

In regards to disciplinary differences between Medical Sciences and Health Sciences, Health Sciences was the more active user discipline. Health Sciences faculty members and graduate students uploaded more documents to their profiles (699 : 621 total documents respectively) and received more profile views and followers than their Medical Sciences counterparts. The most notable difference between the two disciplines is evident when comparing the number of profile views received, as members from the Health Sciences community had nearly three times as many profile views as those in Medical Sciences (See *Figure 5*).



*Figure 5.* Total number of documents, profile views, and followers for Medical Sciences and Health Sciences on Academia.edu.

### **Discussion and conclusions**

Results indicate that there are large populations of Medical Sciences and Health Sciences users on Academia.edu and that these scholars are using the site to network and collaborate with others, to share their research, and to keep up to date in their fields. In other words, researchers in the health and medical field are using academic social networking sites for scholarly communication. The results of this study share both similarities and differences with previous studies on academic social networking sites, academic seniority, and discipline.

In the present study, more faculty members than graduate students registered for an account on Academia.edu. This finding contradicts previous research that suggests that graduate students are more likely to register for an account on Academia.edu, even if faculty members log in and use their accounts more often (Megwalu, 2015). This result is perhaps indicative of the growing need for faculty members to have a professional online presence, but one that is distinct from their personal lives. Faculty also listed more documents on their profiles than did graduate students in both disciplines confirming earlier findings (Thelwall & Kousha, 2014; Megwalu, 2015). These results are surprising, as graduate students would likely benefit more than faculty members from the increased discoverability and access that comes from listing documents on an open access platform such as Academia.edu. After all, to go back to Jordan's (2014) study, junior members were particularly fond of the idea of using Academia.edu as tool to disseminate their research.

However, it is possible that faculty members, who are already established in their fields, have different user needs than students. For example, faculty members might use

their Academia.edu profiles more as a document management tool than as a means to distribute their work. Further research is needed in order to determine whether faculty or graduate students upload more full-text documents to their profiles as opposed to just listing their publications in a CV type fashion. A mixed methods approach, where a survey is used in addition to manually collecting data from Academia.edu, would provide a clearer picture of how scholars are using Academia.edu and their motivations for using the site. Other measures should also be used in order to determine user activity, such as the number of logins by members over a set period of time. Without this additional information, it is impossible to determine whether document number is indicative of a higher user engagement or whether this phenomenon is simply due to the fact that faculty members have more papers to list than graduate students.

Although they were more active on Academia.edu, faculty members did not necessarily garner more profile views or followers than graduate students. This finding contradicts previous research, where senior academics tended to have more connections and a more prominent position within the network in comparison with junior researchers – despite putting very little effort into networking (Jordan, 2014). While Health Sciences faculty had more profile views and followers than graduate students, Medical Sciences graduate students had more profile views and followers than faculty members. In other words, user behaviour on Academia.edu did not reflect scholarly norms and practices in this instance, as faculty members did not enjoy a privileged position within the network due to their academic status and perceived seniority. Instead, this discipline adheres to social networking norms, where younger members are more popular than senior members in the sense of attracting more profile views and followers (Thelwall & Kousha, 2014).

The strong correlation between the number of papers added to a profile and the number of profile views for Medical Sciences graduate students also supports this finding.

Medical Sciences graduate students added fewer papers than faculty members, but still enjoyed more views and followers from listing these documents on their profiles, upsetting the existing scholarly status quo.

In regards to discipline, Health Sciences was the more active user group on Academia.edu, suggesting that intra-disciplinary differences do exist in the health and medical field. This is an interesting phenomenon that leads to more questions than answers: Do Medical Sciences users who register for an account on Academia.edu find that their expectations for the site are being met? If not, are they using other academic social networking sites to fulfill these needs? A comparison of the Medical Sciences and Health Sciences disciplines across different academic social networking platforms, such as Mendeley and ResearchGate, would yield some further insights as to the user needs of each discipline. Also, as an exploratory study, the sample only covered two disciplines – Medical Sciences and Health Sciences. While intra-disciplinary differences were found between these two fields, it would be useful to subdivide these areas even further (i.e. into Nursing, Public Health, Pharmacy) to allow for more granular distinctions at the discipline level.

One limitation of this study is time normalization, as it is not currently possible to see user registration dates on Academia.edu. Thus, newer members might have fewer documents, profile views, and followers depending on when they registered for an account on the site. Self-representation is another important factor to consider, as there is little user accountability on many of these sites. In contrast to other academic social

networking sites, such as ResearchGate, where scholars must register under their own name, members have the option of representing themselves in any way that they like on Academia.edu. However, if scholars do in fact view Academia.edu, and other academic social networking sites, as extensions of their traditional academic network then they are less likely to misrepresent themselves online. After all, members are unlikely to fabricate their achievements and accomplishments if they have a reputation and a career to uphold. Also, many users on these sites, especially faculty members, have a tendency to network with people that they have connections with in real life (Jordan, 2014). These are all powerful incentives that encourage members to create professional – and accurate – online identities for academic social networking purposes.

This study has provided insight into the scholarly communication practices of health and medical disciplines on Academia.edu. More research is needed, however, in order to determine the extent to which the site mirrors existing academic structures (i.e. the faculty - student advantage) and social networking patterns (age, gender, etc.). Further studies should also examine why these scholars register for an account on Academia.edu over (or in addition to) other more specialized social networking tools available to non-academics in the health and medical field. Web-based applications for scholarly communication evolve rapidly and disciplinary norms are constantly changing, as are the communication preferences of scholars on these sites. More research is needed in order to understand this ever-shifting landscape.

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