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Whose Research is it Anyway? Academic Social Networks Versus Institutional Repositories

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INTRODUCTION Looking for ways to increase deposits into their institutional repository (IR), researchers at one institution started to mine academic social networks (ASNs) (namely, ResearchGate and Academia.edu) to discover which researchers might already be predisposed to providing open access to their work. **METHODS** Researchers compared the numbers of institutionally affiliated faculty members appearing in the ASNs to those appearing in their institutional repositories. They also looked at how these numbers compared to overall faculty numbers. **RESULTS** Faculty were much more likely to have deposited their work in an ASN than in the IR. However, the number of researchers who deposited in both the IR and at least one ASN exceeded that of those who deposited their research solely in an ASN. Unexpected findings occurred as well, such as numerous false or unverified accounts claiming affiliation with the institution. ResearchGate was found to be the favored ASN at this particular institution. **DISCUSSION** The results of this study confirm earlier studies' findings indicating that those researchers who are willing to make their research open access are more disposed to do so over multiple channels, showing that those who already self-archive elsewhere are prime targets for inclusion in the IR. **CONCLUSION** Rather than seeing ASNs as a threat to IRs, they may be seen as a potential site of identifying likely contributors to the IR.

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IMPLICATIONS FOR PRACTICE

1. This article provides a concrete way to identify affiliated authors who might have potential works for inclusion in an institutional repository by scanning the profiles of faculty in academic social networks.
2. Articles posted by institutionally affiliated researchers on academic social networks are targets for inclusion in an institutional repository.
3. The utility and accuracy of academic social networks is questioned due to their inability to provide authority control and verification, as well as their wide inclusion policy.
4. Some reasons to help convince researchers to use institutional repositories rather than academic social networks are suggested. A picture is painted of the faculty/student ratio using institutional repositories and academic social networks.

INTRODUCTION

Academic social networks (ASNs) have burst onto the scene, gathering a large number of users in a short number of years. They are loved by some, and hated by others; they can be seen as competition for an institution's repository, or as a holding place for the full-text version of citations found elsewhere online. They are either a great way to increase one's reach, or an insidious waste of time. Love them or hate them, they have made inroads into the academic sphere, and appear to be here to stay—at least until the next big thing.

At the same time, institutional repositories (IRs) have struggled to keep pace with the growth of ASNs. The University of Lethbridge (U of L), a mid-sized university in southern Alberta, Canada, established an IR in 2007 in the university library. While initially a primarily undergraduate institution with a focus on liberal education, in the past two decades the graduate programs have grown substantially as the university focuses on its strengths in the neuroscience, education, and fine arts fields. While there is an established flow of masters theses and PhD dissertations into the IR, the volume of faculty publications has been slow to follow. Certainly, the number of items in the IR is not as high as it could be; a small percentage of faculty authors actively deposit and maintain their current publications in the IR. The submission and inclusion policy for the U of L IR, along with additional information, is available at <https://opus.uleth.ca/>

In 2017 the Research Services group, which oversees the IR, decided to rebrand it as OPUS to make it more attractive, more memorable, and less “institutional”-sounding. We also hoped that this relaunch of the IR would stimulate new interest from faculty, as deposits had been lagging and had historically never been very strong. It was an opportunity to

bring increased awareness of the IR, especially for new faculty members who had missed the publicity efforts made in 2009—the last time a concerted effort had been made to raise the profile of the IR.

Up until now, deposits had been ad hoc and depended on the receptiveness of faculty, the persistence of liaison librarians in promoting and/or asking for submissions, and the success of periodic promotional activities. When the IR first launched, faculty could deposit their own items, but fairly shortly thereafter library staff began to mediate the process to maintain some authority control. At the time, an institutional open access policy was not in place, so there wasn't a lot of incentive or institutional muscle to encourage deposits. The three major Canadian government funding agencies released an [open access mandate](#) in 2015, which we thought would also help drive submissions to the IR in order to comply with this policy, but the increase was smaller than anticipated.

As talks turned to encouraging deposits, the Research Services group began brainstorming ways to reach faculty who might be unaware or simply unmotivated to deposit their materials into the IR. We decided to look up our institutional researchers in Academia.edu and ResearchGate, two of the most well-known and well-used academic social networks, to use as a base of faculty members who might be interested in also having their research made available through the IR.

LITERATURE REVIEW

Academic social networks have been the subject of a fair amount of academic research, given their relatively recent entry into the scholarly communication landscape. A number of studies have been done on the adoption rates by researchers in a particular discipline (Muscanell & Utz, 2017; Marra, 2016; Ortega, 2015; Van Noorden, 2014; Haustein et al., 2014) or a particular country (Mikki, Zygmuntowska, Gjesdal, & Ruwehy, 2015; Campos & Valencia, 2015; Elsayed, 2015; Míguez-González, Puentes-Rivera, & Dafonte-Gómez, 2017; Meishar-Tal & Pieterse, 2017). Mikki et al. (2015) found that ResearchGate was used most often by Norwegian scholars overall, though humanities scholars used Academia.edu more frequently. Almost half of those on Academia.edu also had an account on ResearchGate, but not vice-versa; most researchers had a preference for maintaining only one academic social network profile. Elsayed (2015) also found that ResearchGate was preferred by most Arab researchers, and if they had more than one account the second was likely to be on Academia.edu. In contrast, Campos and Valencia (2015) found that Spanish researchers tended to prefer Academia.edu, though they cite another study (Punin, Direito, & Calva, as cited in Campos & Valencia, 2015) which found that many of these profiles contained no content. Meishar-Tal and Pieterse (2018) also found a prevalence for ResearchGate use by

Israeli researchers, where they also found that most researchers were using social networking tools for self-promotion and increased discovery. Lupton conducted an international survey in 2014 that found a slightly higher use of Academia.ca over ResearchGate; those respondents indicated that networking outweighed other potential benefits, though these responses also included other more general social media use such as Twitter, which was by far the most used social network tool among academics at that time (Lupton 2004). Jamali, Nicholas, and Herman (2016) and Kramer and Bosman (2016) also found that the researchers they studied favored ResearchGate over Academia.edu, despite higher numbers of profiles being advertised by the latter. This highlights the difference between having a profile versus actively using a profile, as users with empty profiles can artificially inflate usage numbers of a tool.

Manca published a review article focusing on Academia.edu and ResearchGate in 2018, which nicely summarized much of the research done to date (Manca 2018). The fact that there is enough literature to do a meta-analysis of this sort indicates the growth of scholarship on ASNs, legitimizing it as an area of research. Manca found that more than twice as many of the studies were done on ResearchGate than Academia.edu. Most of these studies are concerned mainly with usage and uptake among researchers, and Manca points out the lack of critical research on ASNs around issues of their socioeconomic impact. These themes reinforced findings by an earlier scoping review by Kjellberg, Haider, and Sundin in 2016 that focused on library and information science journals. That is not to say there has been *no* critique. For one piece questioning the profit motives, ethics, and data usage of ASNs, see Matthews (2016), and for another critical of Academia.edu's part in the increasing metrification of academia, see Duffy and Pooley (2017). Much of the rest of the literature on these sites is limited to academic social networks' description, reviews, and utility for researchers in terms of reputation, reach, and metrics (for example, Ovadia, 2014). Others have compared the use of ASNs and IRs among researchers; Lovett, Rathemacher, Boukari, and Lang (2017) conducted a survey of their institution's faculty to assess whether academic social networks (specifically ResearchGate) were indeed seen as competition to their institutional repository, and found that those more likely to post their research on ResearchGate were also more likely to deposit it in the institutional repository, or at least to be open to the idea. Swanepoel and Scott (2018) compared the awareness and use of academic social networks and institutional repositories between researchers in Canada and South Africa, finding low levels of uptake and use in both. Borrego (2017) found that among Spanish academics, the use of ResearchGate was many times higher than the use of IRs. He found this was partially due to a lack of awareness of IRs, and partly due to their perceived usefulness. Laakso, Lindman, Shen, Nyman, and Björk (2017) found ease of use to be a major factor in researchers' willingness to use ASNs over IRs, including the automated e-mail prompts to upload recent publications.

Regarding trends concerning IRs, Oguz and Assefa (2014) conducted research that aimed to provide insight into scholars' usage patterns and overall perceptions of IRs. Their research demonstrated that just slightly over half of respondents to their survey viewed IRs in a positive manner, and that "faculty whose scholarly productivity was high in terms of published or unpublished output were more likely to have a positive perception of IRs and therefore were more likely to participate in the IRs than those who did not" (p. 200). Considering the issue of low awareness of IRs among faculty at some universities (Cullen & Chawner, 2011; Kocken & Wical, 2013), it is unsurprising that those who ascribe significant value to attaining high levels of scholarly output are more cognizant and accepting of the various existing methods for making their research available, including IRs. This finding might partially explain the positive correlation between researchers' use of academic social networks and their willingness to submit content to an IR (mentioned in Lovett et al.). The literature on researchers' non-use of IRs is quite abundant, including Laasko, Lindman, Shen, Nyman, and Björk (2017), who nicely summarize the research to date on this topic, citing lack of awareness; concerns about copyright, quality, and version control; and difficulty of use/difficulty maintaining multiple systems. Others on this topic include Foster and Gibbons (2005), Harnad (2006), Xia and Sun (2007), McDowell (2007), Davis and Connolly (2007), Jantz and Wilson (2008), Salo (2008), Covey (2011), Yang and Li (2015), Otto (2016), and Sabharwal & Natal (2017). While some solutions are proposed for increasing researcher buy-in and deposits into IRs, none identify the process used in the current study.

METHODS

The authors searched both ResearchGate and Academia.edu by institution and sorted by departmental affiliation; the researchers' names, departments, and numbers of papers in the ASN were recorded on an Excel spreadsheet. Any names that were not immediately recognizable were looked up in the university directory to validate their affiliation with the institution and to clarify where departmental affiliation was unclear. Only profiles with full-text research were included, thus leaving out the majority of undergraduates with profiles and many of the graduate students. The authors counted the number of full-text publications a researcher had included on the social network, and then checked the institutional repository for the same name and recorded the number of deposits the researcher had made there. The difference between the number of full-text papers available on the ASN and those available in the IR were tallied, and percentages of faculty numbers participating in each ASN as well as the IR were calculated. Data from Academia.edu was collected in June 2017; data from ResearchGate was collected in November 2017.

For Academia.edu, we defined active profiles as those that included at least one research item; the profiles which were essentially empty shells were not included. No one listed as

an undergraduate student or alumnus was included, but those identified as adjuncts, post-docs, and graduate students who were verified via the university directory were included. The rationale for including only faculty and graduate student profiles in analyzing users of Academia.edu was partly pragmatic; since the initial impetus for this data collection was targeting deposits for the institutional repository, undergraduates and alumni do not qualify for inclusion. However, the vast majority of undergraduates and alumni did not include research in their profiles, so the point was moot at any rate.

For ResearchGate, we followed a similar process. Empty profiles lacking full-text items were not included, nor were those that were not verifiable using the university directory. Unfortunately, because ResearchGate does not require its members to designate their level of education, and the university directory does not disclose students' level of study in adherence to confidentiality, we were unable to differentiate between undergraduate and graduate ResearchGate profiles. However, it is assumed that the undergraduate profiles would largely be excluded at any rate due to lack of full-text content, as was the case with Academia.edu profiles.

RESULTS

Academia.edu

Of the 481 faculty members and the 674 graduate students¹ at the institution, 147 had “active” profiles that were verified as currently affiliated with the U of L on Academia.edu. Thus, 12.7% of the researchers at this university are actively engaged with Academia.edu (see Figure 1).

The percentage of researchers active on Academia.edu increases when looking just at the faculty numbers (105 active users out of a possible 481 faculty members) (see Figure 2).

Of the 61 faculty and graduate students who had content both in the IR and on Academia.edu, 55 researchers (90.2%) had more articles in Academia.edu than in the IR. A few exceptional cases are worth noting. One professor had 139 items in Academia.edu and only one in the IR; and another had 274 items in Academia.edu and 6 in the IR; another had 355 in Academia.edu and 10 in the IR. These outliers raised the average number of items deposited by researchers in Academia.edu (21.2); the mode was 8 items. The average number of items deposited by researchers in the IR was 1.4; the mode was 0. Only six (9.8%) researchers had more or an equal number of articles in the IR; the average difference in number of items

¹ <http://www.uleth.ca/analysis/facts/student-enrolments> graduate students as of Spring 2017, last available

on Academia.edu versus the IR was 19.7 more articles in Academia.edu, while the mode was 7 more. Figure 3 illustrates the difference between those with items in the institutional repository versus those with items in Academia.edu.

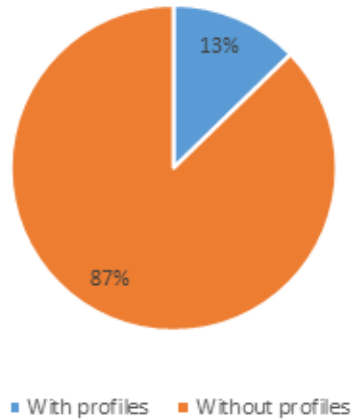


Figure 1. Faculty and graduate students with active, verified profiles on Academia.edu

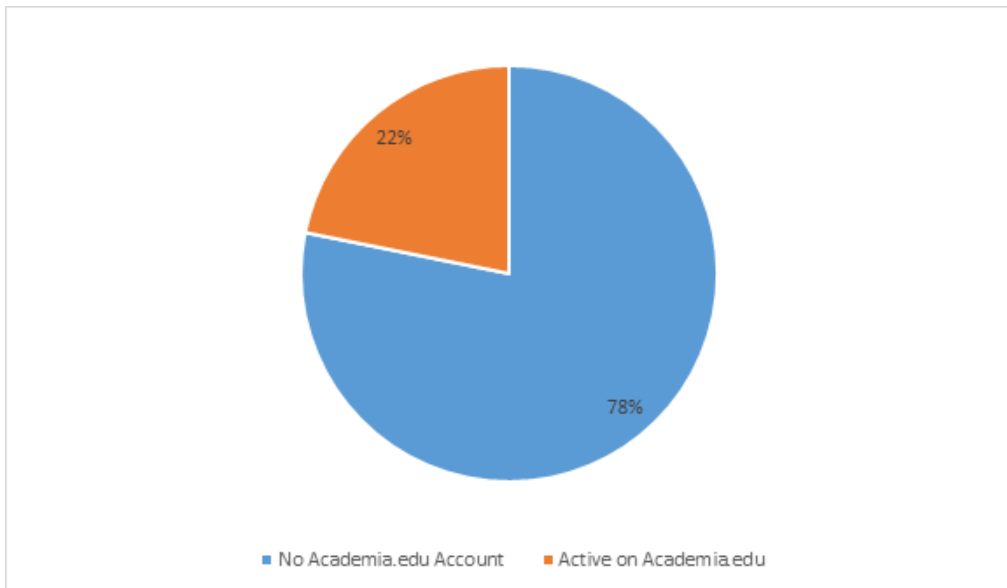


Figure 2. Faculty with active, verified profiles on Academia.edu

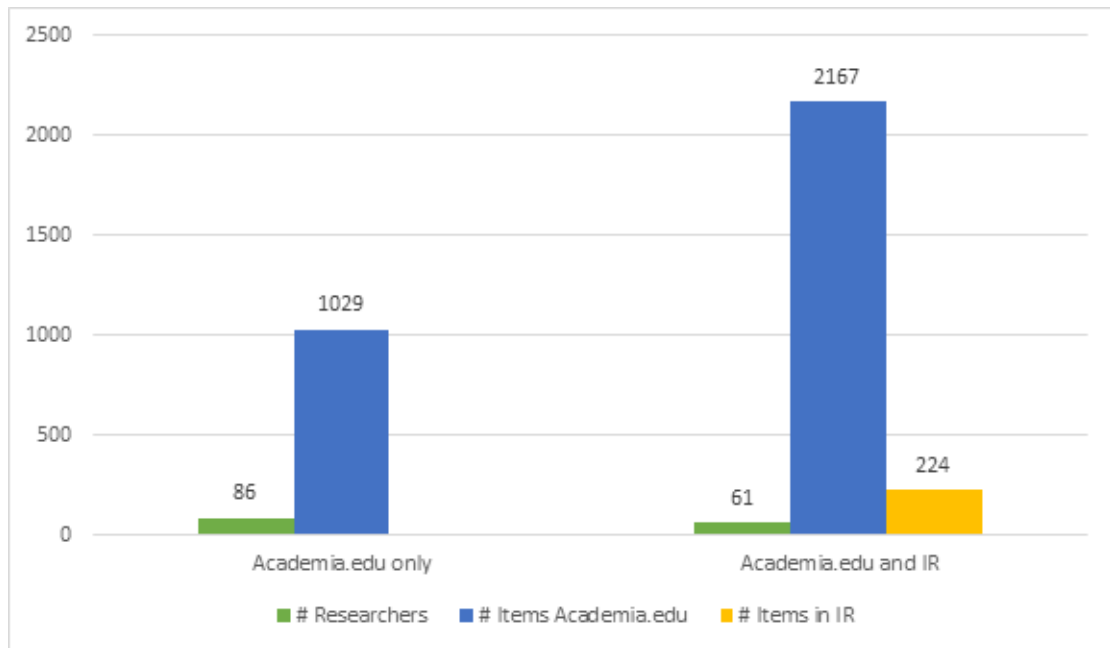


Figure 3. Items posted to Academia.edu versus institutional repository by active users of Academia.edu at the U of L (n=147)

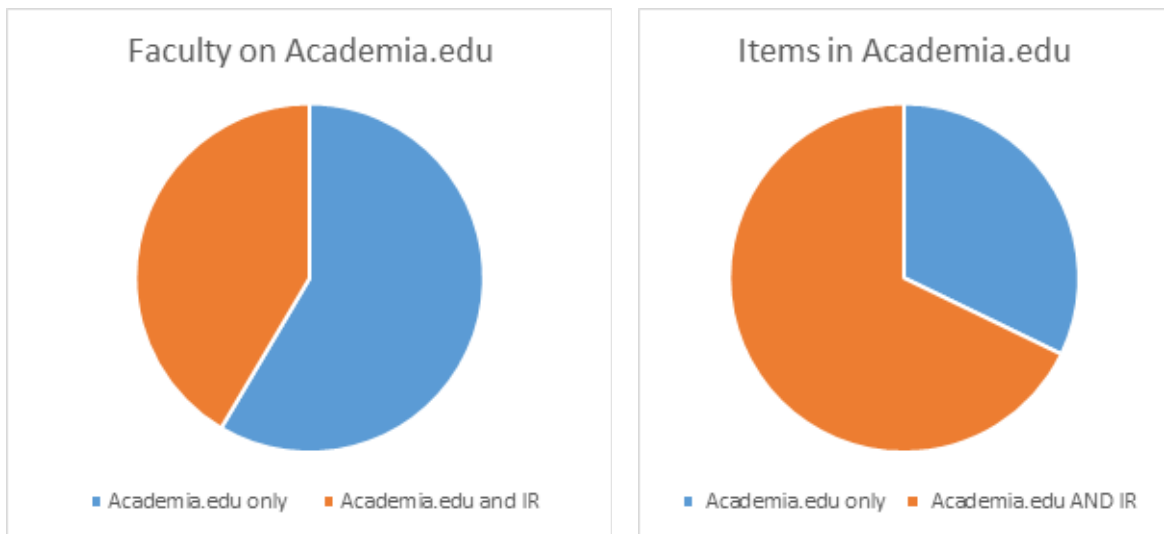


Figure 4. The percentage of faculty depositing only in Academia.edu is larger, but those depositing in both Academia.edu and the IR contribute most of the volume to Academia.edu.

Figures 3 and 4 show that those depositing their articles only in Academia.edu account for a much smaller portion of the content on that site than those who are also willing to put their articles in the institutional repository. Of the items posted to Academia.edu by U of L researchers (1029 of 3196 total items), 32% were posted by the 86 researchers (59% of profile holders) who contributed to Academia.edu only. A much larger portion of the items posted to Academia.edu by U of L researchers, 68% (2167 of 3196 total items), were posted by the 61 researchers (41% of profile holders) who also posted items to the IR. However, Figure 3 also reveals that the 61 researchers using both sites have only deposited 10% (224 of 2167 items) of the number of items they posted on Academia.edu in the IR. Figure 5 illustrates that by far the greatest proportion of items in the IR and on Academia.edu that were deposited by researchers at the U of L who use Academia.edu were contributed by faculty members rather than graduate students.

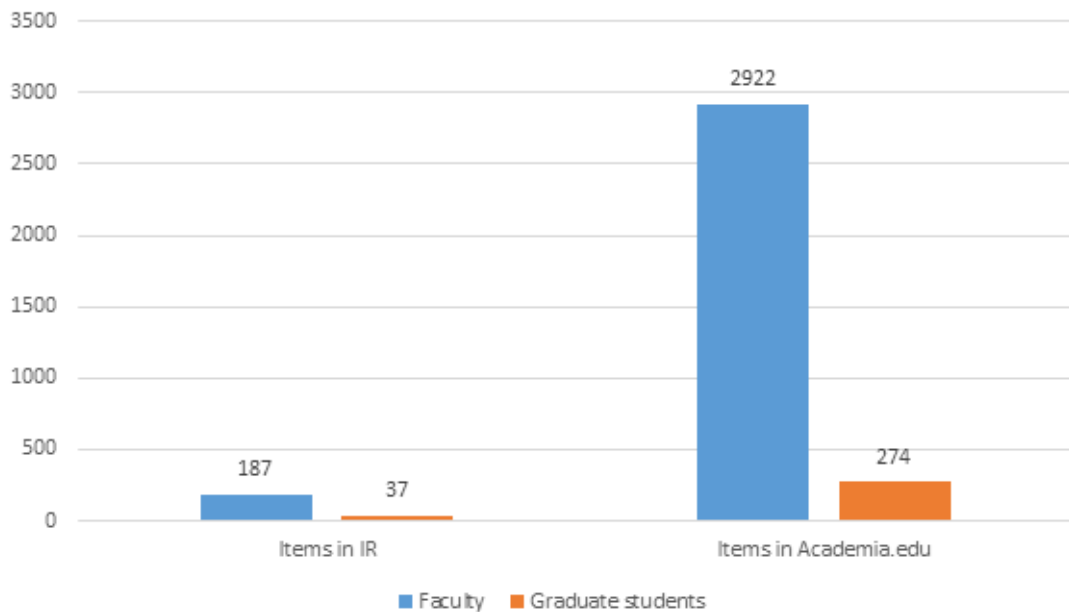


Figure 5. Number of contributions to the IR and Academia.edu by active users of Academia.edu at the U of L, by status (n=147)

ResearchGate

After using the university's campus directory to determine the validity of the profiles connected to this institution, the number of legitimate accounts that were of use for this research was 295. These accounts belong to faculty, graduate students, and potentially undergraduates who are currently affiliated with this university, and who have submitted at least

one full-text item to ResearchGate. Of the 481 existing faculty members, 201 hold legitimate accounts, meaning that 42% have an active presence on ResearchGate (see Figure 6). The remaining 94 accounts examined belong to students, either undergraduate or graduate.

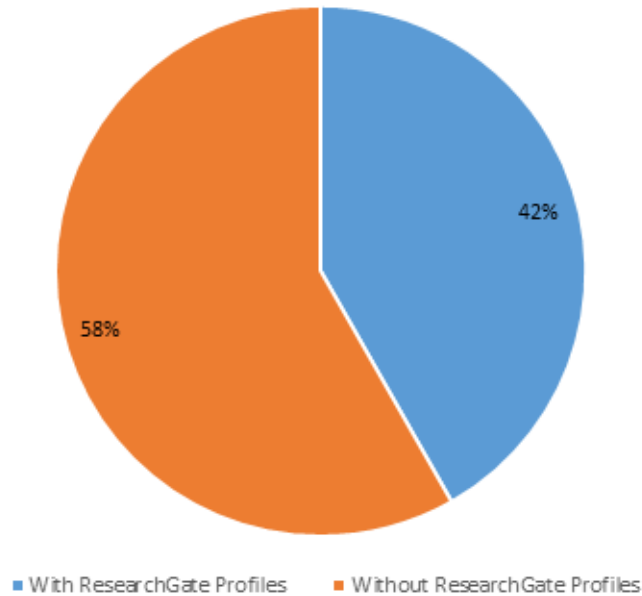


Figure 6. University faculty profiles on ResearchGate

One hundred and forty-seven faculty members had submitted content to both ResearchGate and the IR. Among these researchers, ResearchGate was much more commonly used; the average number of items submitted by a user to ResearchGate was 45, while an average of 8 items per user were posted in the IR. In eliminating the effect of outliers, ResearchGate still proved to be much more highly utilized, with a mode of 20 items submitted per user as opposed to a mode of 1 for the IR. Only six individuals had more items in the IR than in ResearchGate. One faculty member had submitted a singular research item to both ResearchGate and the IR. The remaining 140 researchers had submitted more content to ResearchGate. Figure 7 identifies the differences between faculty members who exclusively submitted content to ResearchGate and those who have populated both resources.

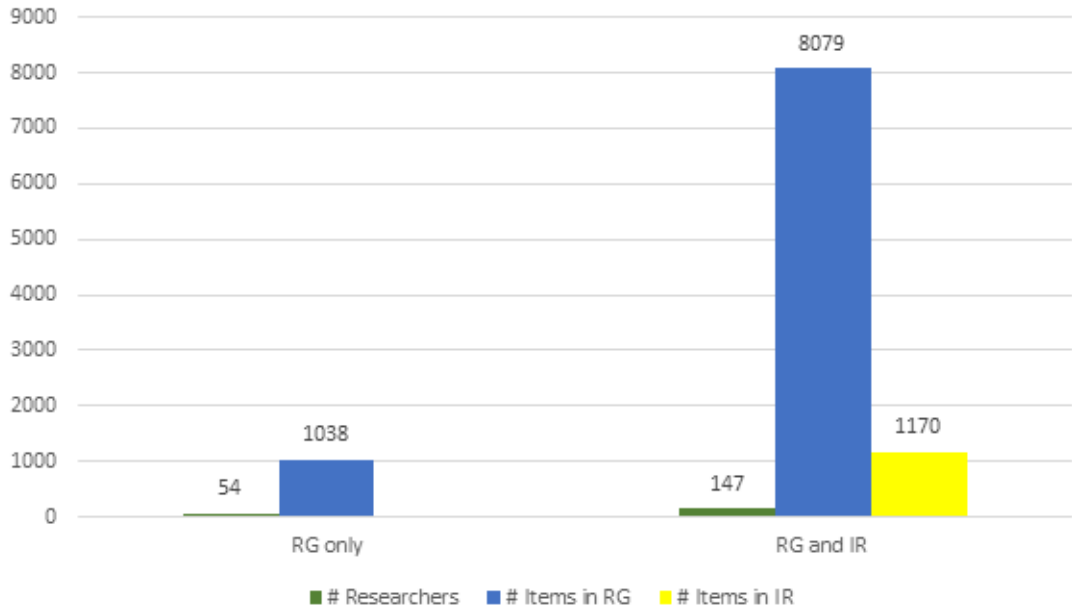


Figure 7. Items posted to ResearchGate versus institutional repository by active users of ResearchGate at the U of L (n=201)

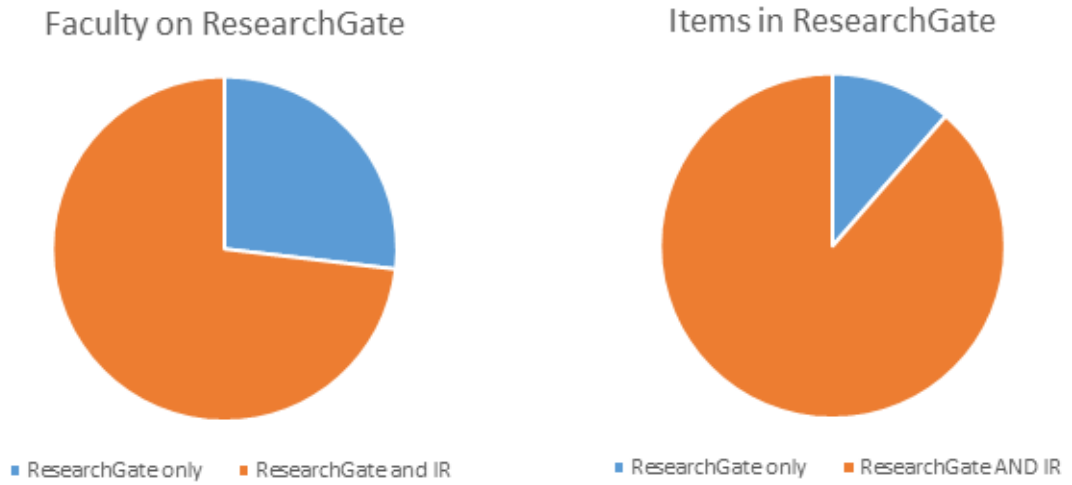


Figure 8. The percentage of faculty depositing only in ResearchGate is smaller, but those depositing in both ResearchGate and the IR contribute most of the volume to ResearchGate

In analyzing the information collected, the same conclusion was found as when evaluating the data of those who use both Academia.edu and the IR. Figures 7 and 8 demonstrate that those who have submitted items to the IR as well as to ResearchGate are responsible for the majority of the output affiliated with the university on ResearchGate. The 147 researchers (73% of the faculty who hold a ResearchGate profile) contributed 8079 items, which is 87% of the output available on ResearchGate. Taking into account that the number of those who only submitted items to ResearchGate is much lower—54 researchers fall into this category, which accounts for 27% of ResearchGate profile holders—their output is still significantly lower per capita than those who submitted to both resources. These 54 researchers are responsible for only 12% of the institution's total research items on ResearchGate.

Concerning the 94 undergraduate and graduate students who are involved with ResearchGate, 45 also had at least one research item submitted to the IR, while 49 were only populating ResearchGate. When analyzing the data connected to the students who were using both resources, we found that once again, the vast majority of profile holders were more active on ResearchGate; this was the case for 43 out of 45 of these students. The average of items submitted to ResearchGate was 11, while the average for the IR was 0.6. Only two students had submitted the same amount of content to both resources; in both cases, the student had submitted one article to each site. Perhaps unsurprisingly, the students were less active overall on both websites in comparison to the faculty members; in many cases, students had fewer than 10 items on ResearchGate, with a few notable exceptions. For instance, one student had submitted 146 items to ResearchGate, and 2 to the IR. These outliers account for the 11.2 item deposit average in ResearchGate, despite the overall low submission rate of most students. The calculation of the mode gives a more accurate picture of usage; the mode for item submission to ResearchGate was 2, while it was 0 for the IR. As is visible from this calculation, IR usage was extremely low; all students had submitted 4 or fewer items to this resource. As was already mentioned, we were unable to separate the undergraduate from the graduate profiles; therefore, it is difficult to say whether there were major statistical differences in the way that students of each education level interacted with the resources, but it is assumed that the majority of these are graduate students (see Figure 9).

Admittedly, 94 students is a small sample size, which is a limitation of this analysis. However, it is noteworthy that this data mirrors the conclusion found when examining the usage patterns of academic social networks that faculty and verified graduate students display. Though in this case there were fewer individuals who submitted to both ResearchGate and the IR (48%) than those who singularly submitted content to ResearchGate (52%), the former smaller group was responsible for 53% of the ResearchGate output, while the latter larger category generated the remaining 47% of the content.

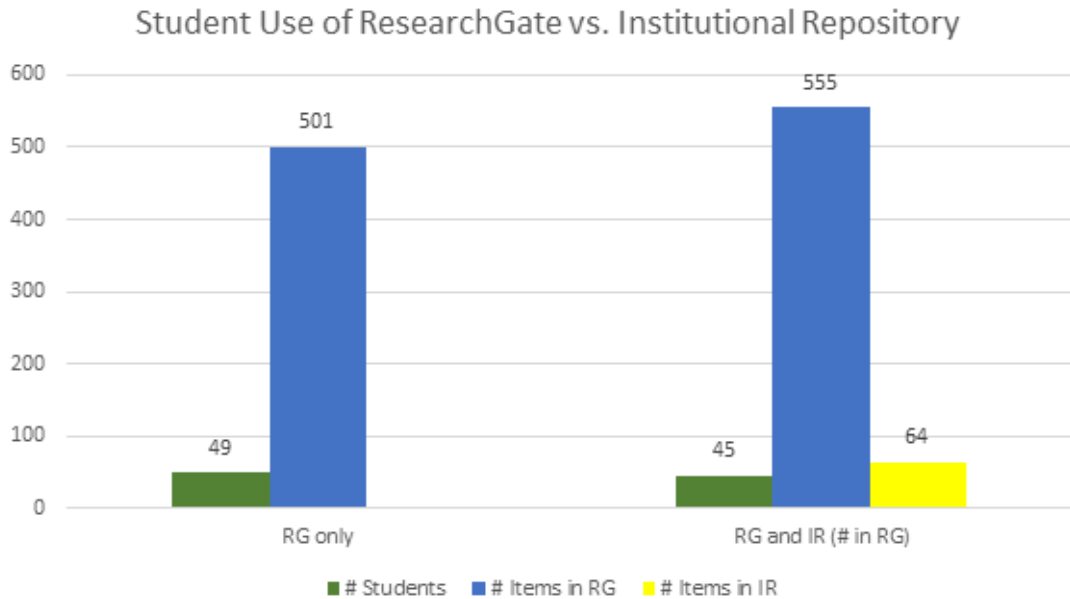


Figure 8. Items posted to ResearchGate versus institutional repository by active student users of ResearchGate at the U of L (n=94)

DISCUSSION

While this analysis focuses on one institution, it mirrors results found at other institutions (as noted in the literature review) and raises questions that could be more generally applicable. At the University of Lethbridge, it seems that ResearchGate is the preferred academic social network. Academia.edu has far fewer validated, active members at the U of L, but that site also has more active participants than the institutional repository. In terms of one of the original research goals—to identify possible contributors to the institutional repository—this project was a success, and those leads will be followed up by the Research Services group. Clearly there is work to be harvested, and as Lovett et al. (2017) found, those posting on one social media site are not averse to having their work on multiple sites. These high-volume researchers would be easy targets to quickly populate the IR with a large body of work. Our work supports Lovett et al.'s 2017 finding that those more likely to place articles on academic social networks are also more likely to place them in the institutional repository; they are open to making their work accessible, and the two OA vehicles are not mutually exclusive. However, it also shows that the IR lags far behind in terms of the number of deposits in the two places by the same scholars. It is possible that some—though not many—of the things they are posting on

Academia.edu would not be appropriate for deposit in the IR; however, that would be a small portion.

Librarians all over struggle to adequately populate their institutional repositories with quality content. Faculty members seem to ascribe equal merit to submitting their research output to an academic social network and putting it into an IR, often preferring the former. These two options are not equivalent, for several reasons. First, as public, for-profit entities, these sites are likely to start monetizing their services (as was seen in early 2017 with Academia.edu). There is no guarantee that these for-profit entities will remain in perpetuity; in fact, it is quite likely they will not. Furthermore, these resources are not truly “open,” since obtaining copies of articles posted requires a login (even if that login is free) and thus does not comply with some funders’ open access mandates. Last, there is the potential for legal trouble should researchers post versions of articles online for which they have signed away their copyrights.

One issue that has not received much attention to date in the literature is the impact these sites might have on an institution’s reputation. It is possible to search by institution, so that one can view all of the profiles associated with any given university to see its research output. Clearly such a view would be incomplete; without everyone in the university being on the same academic social network, a search by institution would reveal only a portion of the complete picture. However, such a search could be quite misleading in many ways. The chief executive of Academia.edu stated in 2014 that one way they might begin to fund their site is through the provision of analytics to universities with researchers who participate in the site (Van Noorden, 2014). But with a lack of quality control built into Academia.edu’s design, these analytics would seem to provide very little value indeed. There is no way to ensure that those who sign up claiming affiliation with any particular institution actually do hold that affiliation, since no institutional e-mail address is required, and anyone can sign up using a Google+ or Facebook account. During the data collection for this study, we encountered many researchers listed as affiliated with the U of L who could not be found in the university directory; it is not clear if they were former students or employees, or just claimed an affiliation where none existed. There were at least four obviously faked “researchers” affiliated with the institution in the present study. One profile belonged to a philosopher named John Locke, whose profile contained 9 papers, some authored by the real John Locke (deceased in 1704) and others on apparently medical and biological topics. Another profile’s stated departmental affiliation was “Kittens”; this profile contained one legitimate-looking paper on supercomputing (a program called Kitten was used), but while one of the authors listed on the publication had the same last name as the profile owner, there was no mention of any of the authors being affiliated with this university. A third profile had the name Jokeson Huwden, with a paper titled “Csgo-Dust 2 Plays Terrorist -B-Rush -Long

A -Long A -Split Cat -Cat -Long A -Fake B -Cat -Fake Tunnels Counter Terrorist.” What damage might it do to a university’s research reputation to have such clearly ridiculous content appearing from those claiming a relationship to it? Another profile claiming a non-existent affiliation with the Department of Marketing at this institution had no papers but 93 followers, and this individual’s profile picture featured a quote in a foreign language. One wonders what motivation lies behind the creation of fake profiles with falsified institutional affiliations, but since it is apparently possible to garner a large number of followers in doing so, one must presume there is some benefit.

Besides the obviously faked profiles, there were many that appeared legitimate and yet did not show up in the official university directory; one assumes there could be questionable content in their profiles with which an institution would not wish to claim a relationship. In addition, there is a general lack of quality control. Several different wordings of the same department or faculty surfaced because those creating their profiles entered this information slightly differently (for example, “Marketing” or “Business Management” rather than “Faculty of Management”). Variants on department names also resulted from typos (e.g., philosophy vs philsophy). In some cases, researchers listed a research area or research institute rather than an official department name (e.g., Lego, real estate). This is not the fault of those creating profiles, since without a controlled list of departments to choose from, one would expect this type of disorganization to result.

Another major problem is that the lack of institutional-affiliated signup control on Academia.edu means that someone could, intentionally or unintentionally, sign up with multiple e-mail addresses and/or Facebook or Google+ logins, thus creating several profiles. We noted during the data collection for this project that at least four legitimate researchers at this institution had two profiles. In all cases, one of the profiles was much less complete, containing few or no papers and sometimes no photo, suggesting that was a “forgotten” account. Thus, the fact that two accounts existed for the same researcher was likely a mistake. Unfortunately it is not possible to merge duplicate accounts after the fact, so if metrics have been gathered on both profiles, a researcher is tied to keeping both accounts open so as not to lose that data.

With regards to ResearchGate, further quality control issues were noted. In conducting a search for the same institution on ResearchGate, 1,305 research profiles were said to be affiliated with the institution. However, the vast majority of these profiles were either empty or outdated; in the case of the latter, the names of researchers who are no longer affiliated with this university remain visible, though their research output should now be associated with their current academic institutions. This occurrence could be due to human error, but in some cases, ResearchGate itself might be responsible for the inaccuracy. Van Noorden

(2014) states that “some of the apparent profiles on [ResearchGate] are not owned by real people, but are created automatically—and incompletely—by scraping details of people’s affiliations, publication records and PDFs, if available, from around the web” (p. 127). Other authors have mentioned this phenomenon (Haustein et al., 2014; Jamali & Nabavi, 2015; and Mikki et al., 2015, among others), but perhaps no one encapsulates the issue more vividly than “Anony-Mousse” in a 2014 StackExchange post. Evidently, much like Academia.edu’s, ResearchGate’s design is prone to some quality control flaws. However, the latter has an advantage over the former with regards to screening fake profiles. In order to join ResearchGate as a researcher and to claim affiliation with an institution, one must provide a verifiable institutional e-mail address. To ensure the strength of this vetting system, we attempted to create a researcher’s profile without providing an institutional e-mail address, and we were unable to do so.

As with Academia.edu, in certain cases, researchers seemed to vastly prefer housing their content in an academic social network; of note was a faculty member who had 240 items in ResearchGate, and 3 in the IR. His submissions to the IR were not his own research—he had submitted the honors theses of some of the undergraduate students he had been supervising. Undergraduates are not currently able to submit their research to the IR, the exception being when supervising faculty members agree to submit undergraduate honors theses on the students’ behalf. This tendency for faculty members to populate the IR with only the work of the students they were supervising and not with their own original research was not altogether rare; this was the case for 60 researchers, many of whom were clearly very active on ResearchGate. This phenomenon raises some questions about how these faculty members view the IR; perhaps they do not see it as a useful resource for disseminating research. Clearly, these 60 individuals are aware that the IR exists, as they have submitted the work of their students. However, for some reason not yet identified, they are seemingly uninterested in depositing their own work.

It would appear that universities could be taking a more active role in monitoring academic social networks. It may also be useful for institutions to establish an open access policy to mandate that the majority of their institutional output is included in their institutional repositories. This would better reflect their true output than ASNs currently do, and reliability might be further improved by dedicating a staff position to monitoring the accuracy and validity of profiles on academic social networks. Tran and Lyon (2017) found that there was much confusion among faculty about the multiple profile systems that exist (both external and internal), and felt there was a role for the library in educating faculty about them, which is one possible resolution. At this point there are more questions than answers, and few solutions—but they are questions that we must begin to ask, and attempt to answer.

CONCLUSION

At the University of Lethbridge ResearchGate proved more popular than Academia.edu for posting research output, and both were more popular than the IR. However, those who use both the IR and at least one ASN account for the greatest amount of content in the ASNs. This suggests that researchers who want to share their work seek multiple ways to do so, and that ASNs need not be seen as a threat to IRs. Instead, they could be a source of information to target researchers more likely to also consider submitting their research to an IR; in this way, they can be seen as a marketing tool.

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