

Oregon State University Graduate Students' Scholarly Landscape and Institutional
Repository Needs

Michaela D. Willi Hooper

Hui Zhang

Oregon State University Libraries & Press

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Abstract

This study seeks to address the following questions: What are the research practices and needs of graduate students? How can new library services and features reduce the gap between graduate student needs and current IR services and features? Semi-structured qualitative interviews were conducted with eight graduate students from different disciplines. The results were analyzed using the constant comparative method, and four themes emerged: (1) varied perspectives on data sharing, (2) confusion over intellectual property inhibits open sharing, (3) incentivizing institutional repositories through researcher profiles and (optional) social features, and (4) the need for centralized training on and access to research productivity tools. Student perspectives on these themes are presented in the results section, and some potential applications for this research are outlined in the discussion.

Keywords: semi-structured interviews, academic libraries, institutional repositories, graduate students

Oregon State University Graduate Students' Scholarly Landscape and Institutional Repository Needs

If institutional repositories (IRs) thrive and open research prevails (yes, one might happen without the other), current graduate students will have played an integral role. Graduate student work populates IRs across the world, including the one at our home institution of Oregon State University, ScholarsArchive@OSU (SA@OSU). Of 55448 items in SA@OSU, 25291 are electronic dissertations and theses (ETDs). ETDs are valuable to their departments, to incoming and current students seeking examples, and to scholars of niche topics that have not yet been adequately addressed by peer-reviewed scholarly literature. Scholars may use their ETDs (and the ideas underlying them) as springboards for books, scholarly articles, and patents.

In addition to being vital current contributors to IRs, many graduate students strive to become tenure-track faculty, who (we hope) will remember their former encounters with IRs positively and be intrinsically motivated to share their data and results without barriers. Libraries' hope in the values and practices of early career researchers can be seen in the Association of Research Libraries' support of SPARC (<https://sparcopen.org/>), which sponsors a yearly OpenCon focused on educating and empowering the next generation of open researchers.

As the Digital Applications Librarian and the Scholarly Communication Librarian at OSULP, our roles are interwoven with SA@OSU and open research promotion. We were curious to ask OSU graduate students how they might integrate

library services in their current and future research processes—and particularly if they were interested in open research. Since we are in the midst of transferring SA@OSU from the DSpace platform to the Hyrax platform, we were also specifically interested in how enhanced IR features might impact graduate students' willingness to deposit in SA@OSU. We centered the interview questions we developed on the following two overarching research questions:

RQ1: What are the research practices and needs of graduate students?

RQ2: How can new library services and features reduce the gap between graduate student needs and current IR services and features?

Literature Review

Much of the discussion around research behaviors, open research and the role of institutional repositories focuses on faculty researchers or on research communities and disciplines writ large (Lwoga & Questier, 2015). A meta-analysis on graduate student information-seeking behavior (Catalano, 2013) found that students' experiences vary by discipline, type of degree, and special needs (distance learners, international learners, etc.). Catalano found that students tend to look to their advisors for guidance and may, in certain circumstances, avoid librarians.

Catalano cites Rempel (2010), who found, in a longitudinal analysis of OSU graduate student behavior, that students may perceive librarians as lacking expertise, or feel embarrassed by their own lack of skills. Rempel also discovered that students find library technology tools frustratingly complex. In addition to asking students questions about writing literature reviews, Rempel asked her interviewees questions related to open access and publishing (p. 542). Their level of

interest in and knowledge of publishing varied, but only one student was highly conversant with open access.

Data Management and Sharing

We asked students specific questions about data management and sharing, since these practices are rapidly changing in many disciplines. A recent article in *Nature* identifies funder open data mandates, initiatives to enhance reproducibility, and researchers' own desire to create impact as pushing data sharing into the norm of academic (or at least scientific) communities. Young scientists find themselves torn between this new expectation and still-real concerns over ownership, scooping, and time investment (Gewin, 2016).

Past conversations with faculty from across Oregon State's campus have found that advisors are interested in OSU Libraries playing a role in both intellectual property and data management education for graduate students. Faculty worry that datasets from ETDs are not being adequately curated and preserved when students graduate, even when the research is federally-funded, and despite faculty supervision (Valentino & Boock, 2015, p. 80).

Libraries are frequent partners in cross-campus efforts to help researchers better manage their data (Corrall, Kennan, & Afzal, 2013). Because graduate students use many different kinds of discipline-specific data, Valentino and Boock noted that library workshops offered to graduate students needed to be generic, focusing on naming consistency and deposit in a repository rather than specific naming conventions and specific repositories. Valentino and Boock additionally found that students were aware of the benefits of data management and data

sharing, but the support they received to do this in their departments was inconsistent. Students were surprised but pleased to learn that the library could help with data management. OSU Libraries has since reached out to graduate students through workshops and credit courses to help them with their data management.

Intellectual Property and Sharing

Given the complexity of copyright law, particularly in the digital age, we anticipated that students would be confused over ownership of both their data and their final, published ETDs. In interviews with graduate students, Valentino and Boock (2015) found that many students did not have a baseline understanding of the intellectual property issues surrounding their research. This lack of understanding has implications for access to information. During the infancy of the OA movement, two English professors noted that, if ETDs are to “further equitable distribution of the information wealth many cultures in the West take for granted, then perhaps graduate students' more studied consideration of the ethical limits of authorship rights is warranted” (Edminster & Moxley, 2002, p. 100).

Use of Institutional Repositories and Interest in Social Features

We were interested to learn interviewees' current perspective on the IR: how they currently envisioned the IR in their research process and what might motivate them to deposit their future work in an IR.

In the past few years here has been a steep increase in open access deposit policies that apply to funding recipients (Charbonneau & McGlone, 2013) or university wide faculties (Fruin & Sutton, 2015; Harnad & McGovern, 2009),

including our own (Oregon State University, 2013). IR deposit requirements for graduate students have received less fanfare, possibly because the precedent for libraries holding these print dissertations and theses goes back over a century (Yiotis, 2008). Disciplinary repositories may attract more voluntary depositors than IRs because research communities tend to be formed along disciplinary rather than institutional lines (Gibbons, 2009). Some believe the future of IRs lies in curating content--including ETDs and open educational resources--that is neglected by the journal ecosystem (Lynch, 2017).

Another trend is the rise of academic social networks (ASNs) such as ResearchGate and Academia.edu, which provide even more functions than journals and disciplinary repositories to foster community cohesion, such as job postings and question boards (Calhoun, 2013). By uploading papers to ASNs, authors increase their works' exposure to others in their disciplines. Two of our colleagues at Oregon State (H. Rempel and M. B. Robertshaw) recently co-authored an Ithaka S&R study of faculty research behaviors in the agricultural sciences (Cooper et al., 2017).

Among other themes, they found faculty were much more interested in and aware of ASNs than of the IR. Laakso, Lindman, Shen, Nyman, & Björk (2017) conclude that, if libraries want to motivate researchers to upload their works to IRs, they should add "ASN-like features through their interconnected institutional repositories" (p. 14).

Because most graduate students are fairly young and younger people are more likely to adopt online social networking tools (Pew, 2017), we suspected our participants might be enthusiastic about ASNs and ASN-like features within IRs.

Research Tools and Training

Rempel, Hussong-Christian, & Mellinger (2011) conducted a series of graduate student focus groups across departments at Oregon State University. They found that their participants appreciated standard library services like interlibrary loan, but didn't know where to turn for help with functions that fall outside of a traditional library, such as programming, data analysis, and writing tools. They also expressed a need for more private and collaborative spaces as well as basic supplies like robust lab computers, unlimited printing, and whiteboards. Participants felt that the university did not communicate services to graduate students in a holistic, connected way, and that graduate student awareness of important campus services was uneven, including their knowledge of library services. Rempel et al. (2011) noted that most cross-campus outreach is indeed focused on undergraduates. The library does reach out to graduate students but many do not attend the orientations and workshops designed to meet their needs. Rempel et al. recommended a new physical and/or virtual space for graduate students to network, share their work, and find out about campus services.

Method

We received funding from a competitive, internal grant offered by OSU Libraries to pay for gift cards for our participants and to transcribe the interviews. We submitted an application, along with our protocol, to the Oregon State IRB, who determined that our study did not meet their definition of research.

We wanted to interview graduate students who had some familiarity with library services, so we recruited via email, contacting participants of past library workshops. Participation was incentivized by the offer of a \$40 gift card to a nearby

grocery store. Since we wanted to identify practices and needs that are common across many or all disciplines, we chose participants from the pool who represented our major programs, and included a mixture of masters and PhD students. Some large programs, such as veterinary medicine, were not represented due to lack of volunteers. In the end, we interviewed eight participants. Participants' degree, length of time pursuing their degree, and discipline are represented in the table below.

Participant	Degree	Year	Discipline
A	PhD	4 th	Biochemistry and biophysics
B	PhD	4 th	Design and human environment (business)
C	PhD	2 nd	Geography
D	PhD	4 th	Wood science and engineering
E	PhD	2 nd	Epistemology
F	MS	2 nd	Crop and soil science
G	MS	3 rd	Engineering
H	PhD		Anthropology

Interviews were conducted in a conference room in the library and lasted about an hour. Both investigators were present during all interviews. We obtained informed consent from participants, providing written and verbal information about why we were collecting the data and how they would be used, and asking if they had questions or concerns about the study. Our protocol (see appendix) asked students how they approached various stages of the research cycle, including finding

secondary sources, conducting primary research, analyzing data, writing up results, and disseminating research. We also asked questions specifically about IRs and ASNs.

After interviews were completed, we sent the recordings to a transcription service company. Because this was an exploratory study and we interviewed a small number of students, we approached the data from a qualitative paradigm. The interview questions are available in the appendix. We asked questions that covered the entire research cycle and reflected topics that, according to recent findings, presented particular difficulty to graduate students, such as data management and intellectual property. Naturally, the topics of students' responses reflected the questions asked. Our focus in analysis was looking at how students perceived these topics, and any unexpected insights about which we would like to do further research. We used content analysis to draw inferences related to our research questions from the students' contexts, previous research, and common themes that emerged from the interview transcripts (Krippendorff, 2004; White & Marsh, 2006). We independently coded the results in a spreadsheet using the constant comparative method (Boeije, 2002; Glaser, 1965).

Several common themes emerged. Students provided particularly valuable feedback about student perspectives data management, intellectual property, and the potential for academic social networking (ASN) within institutional repositories.

Results

We create a list of major topics by summarizing the two lists of codes generated separately by the authors. Shown in the table below, each author

produced a dozen topics with many of them overlapping (marked with bold font), and the final list is compiled by merging similar ones.

Author #1	Author #2	Final
Data	Data	Data Sharing
Dissemination	Dissemination	Tools
Journal Metrics	Journal Impact	Intellectual Property
Networking	Networking	Social Networking in IR
Searching	Searching	
Research Process	Research Process	
Change	Publishing Data	
Intellectual Property	Copyright	
IR	IR	
Library Services	Library Services	
Tools	Tools	<i>Library Services</i>
ORCID	ResearchGate	<i>Journal Impact</i>

Topic Lists Coming from Interview Transcripts

Students Perspectives on Data Sharing

We specifically asked students about their attitudes toward open access, including their willingness to share the underlying data and code of their research openly, such as in an open access IR. While several students strongly supported the principles of open data, driven by empathy or the desire to strengthen science, others saw risks in sharing data: they feared getting scooped, lacked the time or expertise to de-identify their data and prepare it for public consumption, or weren't clear on ownership and the legality of sharing.

When queried about the importance of sharing their own code and data, many students reflected on their own desire to see the underlying evidence for research they encounter. A doctoral candidate in biophysics and biochemistry responded enthusiastically when asked about data sharing, specifically because he felt it could speed the dissemination of science and solve problems like the bias

against publishing negative results (sometimes called the "file drawer problem"). While talked about specific practices, he also talked about the importance of a greater disposition towards openness, saying: "I don't see a point in, especially in this age, doing competitive science. We need to be more open and more collaborative as possible." He spoke of his desire to thoroughly understand how prior research was done: "If I'm reading a paper which is very close my research, right, I want to know like every tiny detail of it. I want to know how did you get that method, every tiny step of it. And also, if they have data, I want to know what the actual raw data looks like."

A PhD candidate in engineering echoed this concern about current research: "They just publish a very small part of what they do but not all the information that other people should have to make that research replicable." A third PhD candidate, in epistemology, also noted that code and data sharing helped future researchers and increased the potential for reproducibility: "And that's part of the reason for the push for publishing data whenever possible, is so other people can use your code and your data and see if they end up with the same results."

But even the most enthusiastic advocates of open science perceived disincentives and complications in sharing in the current environment. One of the same PhD candidates, who so nicely laid out the problem of under-publishing negative results, also said, "Of course somebody's going to scoop your experimental data from time to time, but I think being open and more collaborative is more

important than being competitive. Yeah." Other students were less inclined to take such risks in the service of openness.

Some interviewees indicated they might be willing to share their data with certain individuals, but did not want to make their data available to everyone because they felt it would then be at risk of exploitation and they would lose control of their investment. A fourth year doctoral student who had collected his own data preferred for interested re-users to contact the corresponding author: "I don't know, like just throwing that out might be like risky in some way. I can't like correctly explain what it is, but it's a little bit sketchy I guess."

Another social scientist echoes this discomfort with distributing research data to everyone: "So, if all of that data is made Open Access, so it's not just open to other interested individuals or coalitions, it's also open to corporations and other entities that might want to use that data for harm." A third student likewise is willing to share data with other resources, but only when there is explicit agreement on how it will be used: "You're doing research but that doesn't mean that people can use all the data without your permission."

Social scientists did see the benefits of open data, but practically applying these principles to research with human participants is, in the words of one participant, "complex," given simultaneous responsibilities to protect participants and comply with IRB and other ethical standards. As one student said, "It has very real professional and potentially legal ramifications, too. And I mean that comes back to how do you keep your data, how do you analyze your data, how do you share your data if you do." Another social scientist echoed these concerns: "Some of

that may be sensitive data. It may not be suitable to share. Right. And it may not be permissible to share." Yet a third participant "wouldn't mind sharing [data], if I didn't think that it would pose any risk on that community." The researcher noted that even when personal information isn't shared, communities can still be impacted by the disclosure of data about a specific place (for example, providing information about natural resources found through research may lead to corporate exploitation).

Confusion over Intellectual Property Inhibits Open Sharing

One of the main concerns over sharing data was ownership: students are sometimes unsure who owns the rights to the data they are working with, and thus how they can share it. Some had conversations about ownership and IP in their labs, but more indicated that they had not thought through these topics or discussed them with their advisors. As one participant said: "I think students have no idea [about IP] unless a professor has told them . . . And even among faculty there is a varying level of awareness that this is something we should be thinking about." Clarity around IP requires foresight. It can be difficult to envision all possible scenarios at the beginning of a project. One student recounted that she was working as a research assistant for a professor who died. The lab team then had to puzzle out the ramifications for the deceased faculty member's data: "trying to make it so that it could be used and not just like go and it have no benefit to anybody, with all of this beautiful work."

Other participants felt that the decision to share data was not up to them, since they were relying on proprietary databases or data collected through grants

administered by their principle investigators. Several (including the scientists who were most enthusiastic about open data) felt that the data collected by their lab was owned by the university. Further sharing might fall into, as one participant expressed it, a "gray area," although many realized they held the rights to their own dissertations: "The work that I create from that process of my dissertation is, then, my intellectual property . . . All I am is just the researcher that's analyzing the data."

One student talked about the cost and restrictions involved with using Public Use Files (PUF) as data. Another participant's research was being sponsored by her employer, and she was using data from the company's proprietary database. Data are sometimes kept confidential because the employer or the student expected to file a patent. Students using proprietary sources may be contractually prevented from sharing the raw datasets.

None of the students felt fluent in intellectual property laws and available licenses that might help them exert the desired level of control over their works. Participants mentioned fear of data scooping as a reason they might not share data widely, but none of the participants tied this fear to the thin-to-non-existent copyright protection for data in the U.S. Indeed, few participants were clear about the agreements under which they were using shared or borrowed data. One participant did know that publishing in a journal might lead to loss of intellectual property, but didn't appear to realize that this transfer of ownership occurs through a publisher agreement and is negotiable:

If you're developing anything new, then you have to be very careful where you're publishing it, because if you publish your new survey, if you publish your new like art package or your new R script, your new code that you've created, if you publish that in the journal and they then own it. People don't

have access to it, necessarily, and you don't want the journal to have ownership of it. Another student expressed willingness to share his work open access, but just wasn't sure about the "legal parts of that kind of stuff."

Incentivizing Institutional Repositories Through Social Features

Some students had heard of SA@OSU because they knew theses and dissertations were deposited there, or because they had discovered faculty work there in the past. The majority of students had neither heard of the IR nor used an ASN. This led to the interviewers needing to explain the features of both the IR and ASNs, and even then students seemed unsure of their potential. A few of our interviewees mentioned that an IR feature allowing them to identify, contact, and ask questions of local campus experts would be valuable. Some participants would like an OSU-affiliated webpage or profile showcasing their research. Students reacted positively to altmetrics being available in the IR. While none of the students had heard of the term "altmetrics," some were familiar with the concept of download statistics from platforms such as ResearchGate. Yet some students also felt that an exclusively local platform might not generate enough uptake to drive widespread adoption to function as a social network. As one student said, "Like if no one uses Facebook, why do I post something on Facebook? It's like chicken, egg thing I guess."

Three out of eight students in our interview used ASNs to connect with their peers. Some joined because a critical mass of people they wanted to connect with were present on an ASN, as this quote illustrates: "I went to a conference, I met this bunch of people and I started using ResearchGate, and almost most of them are on

ResearchGate." Like their peers, these students are attracted to ResearchGate because it provides an easy way for them to ask questions and share content with other researchers. One student notes, "And also the other beautiful thing about ResearchGate is the questions. So you can ask a question about anything and you have these threads. It's fantastic."

Need for Centralized Training On and Access to Research Productivity Tools

Students generally felt like they were able to find and access the books, articles, and other traditional media they needed to write their literature reviews (although, as expressed above, many desired greater access to other research outputs such as raw data). Many students began their research with Google Scholar or resource recommendations from their faculty members. Students knew about and regularly used interlibrary loan (ILL). One student was "really stoked" that she was able to access so many Spanish language resources through ILL.

While students felt they had sufficient access to traditional library resources such as books and articles, they expressed more frustration about getting what they needed to *produce* scholarship, such as server space for their data (and the tools and training to analyze it), transcription software, and proofreading services. This theme reinforces Rempel et al.'s 2011 study. Students from less well-funded disciplines-- and students who lacked personal economic resources--most acutely feel the lack of access to tools that would increase the efficiency and quality of their labor:

It's just funding I guess, to be honest. Like if I have money I can like do whatever I want and like pay for that . . . what I really wanted was like a transcription

software, like Dragon, but I heard it's pretty expensive but I want to try it because it's going to save a lot of time . . . I'm doing 25 interviews and that's going to be like more than a month or two months.

Part of student frustration stemmed from the decentralized nature of research productivity tools on campus, and lack of centralized outreach and access. The previously-quoted participant felt that she sometimes got the runaround when trying to improve her workflow: “Like go here and go there, and like I’m like running all around the buildings just to get one simple answer sometimes.” Another interviewee noted,

So far I've been working with the various, the IT, so the computer help desk and, and I've kind of worked my way up and down the chain within that call center . . . when I was first trying to get access as a student to SAS and the secure data, basically we got tired of getting pushback from the university, and my advisor just bought SAS for me.

Some students also emphasized that it was not simply access to resources that were needed, but even support in locating and choosing such services. One interviewee noted that ESL graduate students often relied on transcription and copyediting services to conduct and package their research in English, currently the dominant language in academia. While this particular student had the means to pay for such services, he expressed interest in a referral program that would vet reputable professionals.

Digital Tools Mentioned*	Training Available through
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	University
MS Excel (7)	No regular training offered for students
MS Word (5)	No regular training offered for students
Zotero (4)	Offered every term by OSULP
EndNote (3)	Offered every term by OSULP
R (2)	Offered as a section of data carpentry workshop offered by OSULP
Python (2)	No regular training offered for students
SAS (2)	No regular training offered for students
NVivo (2)	No regular training offered for students
Dedoose (2)	No regular training offered for students
<i>* by more than one graduate student, ranked by frequency. 21 other tools were mentioned at least once.</i>	

Discussion

Interviewing these eight researchers about different stages of their process strengthened some of our preconceptions and challenged others. It did not surprise us that students experience confusion around open data and intellectual property. The qualitative nature of this study allowed us to see how these concerns were linked to and affected by students' unique circumstances. We concur with Boock and Valentino (2015) that students would benefit from more education on intellectual property and data management practices. Students find these topics, and particularly their intersection, confusing. This is hardly surprising, since even those who have committed substantial time to understanding copyright can find the laws surrounding work-for-hire, database copyrightability, and co-authorship confusing.

Any such curricula should take into account graduate students' relative lack of funding and control over their own research: they may be researching in a lab and lack clarity about ownership of the outputs; they may be renting or borrowing data from a proprietary database, public use file, or faculty member; they may lack clarity about what kind of social science data is ethical and safe to share. Because of this,

data management and intellectual property support should also be promoted to PIs and others who hold a great deal of control over the funding, collection, and management of the data graduate students use in their ETDs.

IRs and ASNs are different types of services, and each holds unique value for researchers (Fortney & Gonder, 2015). For instance, most IRs are committed to longer-term preservation because they are run by academic libraries. Many IRs are also committed to advancing a copyright-compliant vision of “green” open access. This vision promotes open licenses with clear re-use rights, such as those from Creative Commons (<https://creativecommons.org/>). The generally open, curated nature of IR platforms can make them more useful as sources of data for digital humanities and other research projects (as noted above, students indicated they would appreciate more freely available data sources). In contrast, ASNs are highly automated and generally put the burden of copyright compliance on authors, leading to widespread uploading of articles that are not copyright compliant (Jamali, 2017).

As we expected based on the prior literature, the students in our study were more familiar with ASNs than IRs. Though most were interested in online profiles that enhanced their visibility and allowed them to identify cross-campus experts, some expressed reservations about spending time on social networking, in general, and especially about local social networks that might have limited traffic. In contrast to stereotypes of millennials swarming the latest social media platform like moths, these emerging scholars had limited time and joined ASNs to accomplish specific goals, like staying in touch with peers or getting full text.

Based on this feedback, academic institutions and libraries seeking to attract researchers to use repositories may need to focus on (1) building social networks that connect many institutions (thereby increasing traffic and networking potential) and (2) providing profiles for all scholars, whether or not they choose to take advantage of any social networking features. Many libraries, including our own, have offered programming on digital privacy, using resources such as those found through the Library Freedom Project (<https://libraryfreedomproject.org/>). It is important to consider users who choose *not* to engage with social media platforms, whether due to lack of time, privacy concerns, or other reasons. Twitter handles, Facebook profiles, and other forms of social networking should not be required to access library services. Simply providing the option for researchers to add up-to-date contact or CV information in repositories could also facilitate communication about re-use of others' data, since many scholars are still reluctant to openly share their data for a wide variety of reasons. A profile with optional or no social networking features could easily be generated from scholars' ORCID (<https://orcid.org/>) IDs, such as with OpenVivo (<http://openvivo.org/>).

Our participants were generally satisfied with library services, especially mentioning ILL and graduate student workshops providing education about tools such as Zotero (the popularity of this last tool may be due to selection bias, since our sample was drawn from graduate workshop attendees). Interviewees indicated that important information is often shared via word of mouth, between lab partners or through communication with faculty. Students generally though information distributed more broadly (such as emails and announcements) may not receive as

much attention, although some had learned of workshops through those means. Thus, continued efforts to work directly with academic departments, faculty, and labs may increase awareness of library services. It may be especially fruitful to engage labs and other research groups in early discussions about intellectual property and appropriate use of data. PIs may be particularly interested in this type of support given widespread concern about “scooping.”

Students were frustrated by what they perceived to be “getting the run around,” especially when they are seeking specific tools to conduct research. The decentralized nature of many tools also led to the sense that tools are not equitably distributed across campus. Our colleagues are already engaged in bringing the Writing Studio into the Valley Library building, and collaborating more closely, as well, with Student Media Services. The Library may also be able to serve graduate students by being a connector or hub, if not the main provider, of productivity tools. For example, the Library could maintain a guide of productivity tools licensed to the whole campus. Further research could be done on the need for and availability of tools on campus, and how this affects the efficiency and quality of student work, especially students who do not have external funding. Based on this further research, librarians might advocate for more campus-wide licenses or explore ways to raise awareness of--and support--free, open source alternatives. Providing documentation and technology-related workshop information in one place would likely also be well-received.

Conclusion

The research goals of the students in our small study varied widely: some (those planning to exit academia after obtaining their master's degrees) were motivated by the interests of current or future employers; many (especially social scientists) were empathetic to the particular community they were studying, seeking to guard their participants' confidentiality while simultaneously advancing understanding; scientists, especially, expressed a desire to generate knowledge with the goal of universal benefit and access. All were deeply immersed in their disciplinary culture, looking to their peers and faculty for guidance. They appreciated the support the library provides, especially Zotero training and other tools that save them time and increase their productivity as scholars. Most felt that intellectual property and clear data sharing agreements were important, after these concepts had been introduced to them. In contrast, most had actively sought information about productivity tools and services, and found the decentralized nature of these services frustrating. Certainly, data services and research productivity support have been less traditionally in libraries' bailiwick than ILL and subscription journals, though that is rapidly changing. As libraries explore how they can meet emerging researcher needs with limited resources, a continued challenge will be coordinating with units offering related services and raising awareness of new services as they are developed.

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Appendix: Interview Questions

What type of research are you currently engaged in, or have you conducted in the past?

Could you tell us a little bit about what it means to “do research” in your discipline?

Who do you look to for advice about doing your research?

How do you think research will change in the next ten years?

When you are conducting research (such as gathering data, analyzing, etc.), what are some important tools that you rely on?

Why do you use these tools – what about them is useful for you?

Are there any features that you wish these tools had but don't?

Let's move on to the writing and publishing stage. What tools do you use for writing up your research?

Are there any features that you wish these tools had but don't?

Let's talk about publishing and distributing your research. Who do you want to share your research with?

Why is it important for you to share your research with these group(s)?

Is it important to you to be able to show the underlying code and data of your research? Why/why not?

Do you care if your research is available to everyone (i.e., open access)? Why/Why not?

Have you ever submitted your work for publication to a journal? If so, why did you choose to submit to that particular journal?

If you haven't submitted to a journal yet, have your mentors or advisors given you advice about publishing?

Have you heard of ScholarsArchive@OSU, OSU's institutional repository?

Have you ever considered depositing your research in ScholarsArchive? Why or why not?

What features would you like to see on the platforms through which you share your work (i.e., Research Gate, if they have not used IRs)?

Is it important to you to share your data along with articles and other research outputs - on the same platform?

Are you familiar with research metrics (impact factor, h-index, altmetrics)? Is this a feature you'd like to see in institutional repositories? What metrics, in particular, are important to you?

What other tools or features do you wish existed to facilitate the creation and distribution of your research?

Is there anything we didn't ask that you think we should? How can the Library better support your research?