



Help-Seeking Behaviors in Research Data Management

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Abstract

Investigations on the help-seeking behavior of academic library patrons have, to date, primarily focused on the undergraduate experience, most often in the context of reference interactions. This study seeks to explore the help-seeking behaviors of a different audience - faculty in the natural and physical sciences at an R2 land-grant university. Eighteen faculty in the natural and physical sciences at the University of Idaho were interviewed, and it was found that faculty seek help from colleagues; peers outside the university, via connections formed in graduate school or professional circles; and through do-it-yourself solutions like "just googling it," but less often through university resources and programs. These results are a starting point to explore how libraries might better understand the help-seeking behavior of research faculty, with an eye towards developing services and sources that better meet faculty research needs.

Introduction

After years of discussion about the needs of researchers in the domain of data management, librarians at the University of Idaho felt compelled to identify those needs and create services appropriate to them. While not a new concept - services in research data management have been created and discussed frequently for the past ten years, and "numeric data services" for nearly 50 years (see [Thompson & Kellam 2016](#)) - the University of Idaho exhibits different dynamics than its peers. As a public, land-grant institution, it bears the same mission as much larger land-grant institutions, and yet is a fraction of their size, with only 11,000 students, while research expenditures are in the range of \$110 million annually. Its library is similarly under-sized, with a staff and faculty significantly smaller than its peers ([ACRLMetrics 2018](#)). As a result, most services are integrated into the work of the entire library faculty and not the domain of specialists, as is the case with larger institutions.

This study investigates researcher needs and identifies particular strands of "help-seeking behaviors," which can be viewed as a sub-category of information-seeking behavior, but specifically seeking assistance or support and not just access to information ([Keefer & Karabenick 1998](#)). Help-seeking behavior might be explained as one of two strategies: 1) pursuing mastery to develop skills independently ("instrumental help-seeking"), or 2) pursuing a partnership to solve a problem ("executive help-seeking"), which generates a dependent, and in this case, productive relationship ([Black 2016](#)). As our researchers are arranged in a relatively decentralized, highly autonomous network of academic fiefdoms, we see a heterogeneity of knowledge and capacity across these different fields leading to the selection of different strategies. Researchers possess tremendous authority within their research programs, but little outside of it. Their students are critical collaborators in their research programs and, therefore, essential partners in their research. Our results confirm what others have reported about their institutions: research data services are needed, most researchers can manage to get by, but they know that there are other, possibly "best" practices that could be employed to better manage information and data during research. To do this, however, our researchers seek help in numerous ways for research data management and tend to utilize these two behavioral strategies in different ways.

Literature Review

Over the past decade, academic libraries have worked to support the growing data management and scholarly communication needs of their campuses in the ever-changing digital world. Research has examined these needs from various perspectives and themes related to scholarly communications practices ([Cooper et al. 2017](#); [Cooper et al. 2019](#); [Dawson 2014](#); [Hendrix 2019](#)), data management and data sharing ([Akers & Doty 2013](#); [Berman 2017](#); [Buys & Shaw 2015](#); [Federer et al. 2015](#); [Scaramozzino et al. 2012](#); [Tenopir et al. 2011](#); [Tenopir et al. 2015](#); [Wiley & Burnette 2019](#)), and the needs and challenges of researchers ([Mohr et al. 2015](#); [Monroe-Gulick et al. 2017](#); [Nickels & Davis 2020](#); [Scaramozzino et al. 2012](#); [Westra 2010](#)) have taken center stage. Most studies have also included questions that encouraged researchers to consider how they worked with their own libraries and whether the library could meet their information or support needs. Studies that focused on researchers at specific universities and findings related to researchers' needs and challenges, as well as their perspectives on library roles, are most closely related to the present study.

Needs and Challenges of Researchers

Across studies, challenges related to managing and storing data, seeking help, identifying and working with collaborators and research teams, as well as acquiring data-related skills (both for themselves and their research teams) were consistently shared. Researchers expressed a lack of confidence in their own abilities and skills related to data management and storage ([Scaramozzino et al. 2012](#)) and that they needed greater support, especially for long-term preservation ([Mohr et al. 2015](#); [Monroe-Gulick et al. 2017](#); [Nickels & Davis 2020](#); [Westra 2010](#)). These concerns with data management and storage were often connected to a lack of “resources (time, people and funds)” ([Mohr et al. 2015](#)), the need for additional tools and services ([Westra 2010](#)), as well as gaps in knowledge about storage infrastructure on university campuses and storage options for cross-institutional research teams ([Nickels & Davis 2020](#)).

Many faculty indicated the need to reach out to others for assistance and reported that they often sought help from their own colleagues as well as their larger campus or disciplinary communities ([Monroe-Gulick et al. 2017](#); [Nickels & Davis 2020](#)). Even though faculty were willing to seek help from others, many reported that a lack of information about who had expertise in specific data-related topics, what support and services were available, and how to gain access to these services hindered their ability to do so ([Monroe-Gulick et al. 2017](#); [Nickels & Davis 2020](#)).

Researchers also shared that they were interested in learning additional data-related skills and wanted members of their research teams to pursue these opportunities as well. Topics of interest included skills related to various aspects of data management ([Scaramozzino et al. 2012](#); [Westra 2010](#)) and specific tools and programs, such as ArcGIS, GitHub, Microsoft Word, and Python. Researchers also indicated that they lacked expertise in project management and, although they found these skills important and expressed interest in developing them, they “preferred to hire a project manager to provide logistical coordination and project oversight so that they (the researchers) could focus on conducting the research” ([Nickels & Davis 2020](#)).

Perspectives on Library Roles

When researchers discussed their needs and challenges, some believed that the library could provide support ([Monroe-Gulick et al. 2017](#); [Nickels & Davis 2020](#)) while others did not ([Scaramozzino et al. 2012](#)). Some researchers expressed that libraries had the expertise to provide assistance with data preservation, access to data storage, data management, and other scholarly communication topics such as authors' rights and impact metrics ([Monroe-Gulick et al. 2017](#)). They also viewed libraries as campus entities that could potentially connect them with other people who had knowledge and expertise that could be useful to their own research, even if they were outside their own discipline ([Monroe-Gulick et al. 2017](#)). Another study found that when researchers sought research support from the library, differences emerged based on career stage. Both early-career and mid-career researchers reported seeking help with data management, while mid-career researchers also sought help with other data and research-related topics, such as data storage and visualization, literature searching, bibliometrics, and finding grants. Comparatively, late-career researchers did not report seeking help with data-related topics and instead reached out to the library for assistance with topics such as literature searching and bibliometrics ([Nickels & Davis 2020](#)). Another study found that even though researchers wanted to gain additional skills related to data management and needed support, "they [did] not perceive libraries as a source of data management expertise" ([Scaramozzino et al. 2012](#)).

These findings in combination with the needs and challenges of researchers indicate that additional research is needed to learn more about researchers' help-seeking behavior. The current study is certainly not the first to examine the research practices of faculty at a university. However, the rapidly changing landscapes of data management and scholarly communications make it vital for academic libraries to both understand their own unique institutional contexts as well as share their findings in an effort to expand the research literature. This article further fills a unique gap in the literature by investigating researchers at a small, public, land-grant institution and examining their responses in the context of help-seeking behavioral strategies.

Methods

After receiving Institutional Review Board approval, interviews were conducted during the spring of 2019. Fifty-four faculty in the natural and physical sciences were contacted via direct email invitations, with 18 agreeing to be interviewed. A standardized set of eight open-ended questions (see [Appendix](#)) were used to explore seven key areas: data storage, data management, data publishing requirements, data sharing methods, scholarship, avenues of assistance and help, and an open-ended magic wand question inspired by the Ithaka S + R study on agriculture practices from 2017 ([Cooper et al. 2017](#)). Interviews with participants were conducted at either the researcher's office or at a meeting space in the Library and were recorded by the primary investigator. Participants were given an informed consent form as well as the interview questions to review before the start of their session. The interviews took between 30 to 90 minutes to conduct.

Interviews were transcribed using *TranscribeMe*, a service that provides rough transcripts of submitted audio for a modest price. The low price tag came at the expense of the research team

needing to perform fairly substantive quality control and clean-up on the transcripts. Once the transcripts were ready, the research team moved on to identifying and testing a coding platform.

Several platforms were reviewed, including *Nvivo*, *Atlas.ti*, and *Dedoose*. In the interest of thoroughly evaluating options, we analyzed our two test transcripts in free trials of the software, as well as with an in-house, open source tool called *Oral History as Data*. Ultimately, we selected the in-house tool due to cost, the potential to customize the tool with assistance from our library staff, and because the unique features of *Oral History as Data* supported our analysis.

A special customization of *Oral History as Data*, renamed *RSSS Interviews Analyzer*, was spun-off for this project by Devin Becker at the University of Idaho. This customization supported enhanced multi-level tagging, and introduced new features that made it easier to identify where tagged comments occur in context. Both *Oral History as Data* and the base code for the *RSSS Interviews Analyzer* are publicly shared via a GitHub repository (<https://github.com/uidaholib/oral-history-as-data>) and are intended to be used by other librarians and researchers interested in qualitative tagging but without access to more expensive and intensive analyzers. Unlike some of the other tools mentioned, *Oral History as Data* and *RSSS Interviews Analyzer* primarily visualize where tags occur in a transcript and present transcripts in an easily searchable visual format. Notably, both these tools do not produce quantitative data for statistical analysis by default, for instance, the occurrence of a number of terms in a transcript.

To create codes for the transcript content, the research team iteratively developed three levels of coding vocabularies following tests with the two cleaned interview transcripts. The first level was designed to identify responses by question type and was a limited vocabulary of seven terms correlated to the seven primary interview questions. The second level was a controlled vocabulary of terms that were identified when testing coding procedures on the two cleaned transcripts; these terms were then consolidated and standardized. Our research team members could suggest and add new second level codes as they coded additional interviews, but would ideally only contribute new codes when previously unseen topics, subjects, or themes arose, as opposed to adding closely related concepts. The third level of codes was an unrestricted vocabulary that allowed for fine-grain notation when sentiment, context, specific tools, and processes were mentioned.

Each interview was coded by two members of the team, and any outstanding discrepancies in coding were discussed and resolved on a final review. Once the interviews were fully coded, each researcher downloaded a local copy of the *RSSS Interviews Analyzer* instance and used the tool to review and analyze respondents' answers. Research team members then wrote analytic memos for each interview they coded that summarized interviewees' answers to the original questions posed. The flexibility of our coding process and platform allowed the research team to approach this task in many different ways, with some relying on the codes and visualizations and others doing in-depth mining and analysis of quotes via close reading of the transcripts. This process produced a well-rounded perspective on respondents' replies, which were then analyzed by the group for key recurring themes and concepts.

Results

Most faculty researchers, including those interviewed for this project, have spent years of their lives building expertise in both their chosen disciplines and the research methods appropriate to those disciplines. As such, it may be easy to assume they have an adequate understanding of issues related to data creation, acquisition, management, and distribution. Our interviews, however, revealed that faculty do not always feel confident in their own abilities to undertake these activities. They not only describe a number of approaches to seeking out additional help, but also admit that, while what they are doing seems to work adequately, they recognize that there may be better approaches. We grouped common patterns of behavior into the following themes.

Help from Colleagues (and Google)

Of the interview participants, eleven reported reaching out to other researchers, both current and former colleagues, to enhance their own understanding of technology, data management, and other aspects of research related to their own. Typical of this attitude, one animal science researcher stated:

“So really, I start walking down the hall and talking to colleagues who have been in the business longer, who understand some of the challenges, and try to get the wisdom of the full professors and start asking. I'm not bashful for asking questions and using those resources. Sometimes our limitations are we just don't even know what our resources are...”

This researcher further indicated their need for assistance from colleagues:

“I don't do a lot of bioinformatics. I don't fully understand all the data that does come off of that, but I work with others who do. And so that's how I get around managing some of the challenges that are out there. I just look for others who are more comfortable dealing with those different types of data.”

Seeking help from colleagues in interpreting unfamiliar data sometimes coincides with seeking help with managing these data. Another researcher highlighted how both current and previous colleagues are a natural source of assistance, stating:

“Basically, I go to colleagues who I know have done it [laughter]. Yeah, seriously. I call them up or walk down the hall or whatever it is and say, 'Hey, we've got this and we're trying to get it on here. I'm stumbling on this. How did you get past that?'... For me, it's usually outside the university, just because that's - yeah, I guess because my colleague base was built before I came here.”

Although faculty understand that reaching out to others is a necessary part of their own educational process, they also described the challenges with this approach. One human health researcher reported that, as a new faculty member, they had tried reaching out to researchers at a neighboring university when they were “seeking technological help.” Although offers of

assistance were initially made, eventually the “collaboration just died after sometime,” forcing the faculty member to find alternate means for assistance.

To combat their own gaps in knowledge, another participant admitted they would just “ask around with the people that are easiest to get a hold of to answer questions” or try Googling. They also expressed a desire to attend some of the university-sponsored advanced Excel workshops but lamented that they had never been able to fit them in their schedule. This participant also touched on a very important aspect of help-seeking - developing the confidence to ask for help, a confidence they attributed to having worked in industry before transitioning to the academy. The participant indicated that their help-seeking strategy actually began back in graduate school when trying to learn Excel. They stated, “a lot what I did was guess and check, but I would just ask fellow grad students.”

Still, asking for assistance from time-pressed colleagues and/or having to publicly admit their own shortcomings, however understandable they may be, does pose challenges for researchers. A simpler approach is used by many. Seven of the participants specifically mentioned trying a do-it-yourself approach either primarily or initially when faced with questions. When asked who they went to for help, one respondent said, in regards to issues with data storage limitations, “Usually nobody (laughter). I usually try to figure it out on my own, or I do something like delete files from Dropbox (laughter). It kind of works itself out. Yeah, I can't think of a single person that I've actually sought out for help on stuff like that.”

For specific questions especially, Googling for help is often seen as the quickest and most effective approach for a number of the faculty members interviewed. One indicated, “If [I] have a specific question, too, I'll just try to Google how do you do this in Excel and then try to follow the steps that they provide.” Another such participant did not mince words when they succinctly responded to a question of whom they sought out for assistance with research challenges. The response was simply, “Google.”

Help with Data Repository Submissions

Although eleven participants indicated that submitting their data to discipline-specific repositories, either out of obligation or personal desire to share, did not pose a problem, five indicated that it was a time-consuming, tedious chore. Upon being asked if they were given a magic wand to make research easier, what would they want to do, one faculty member said:

“I think one of the other things that the library could potentially help with is finding maybe data-sharing platforms, for lack of a better word, that could be used. I just don't ever, you know, do a Google search, 'How can I best share my files?' (laughter). But, you know, maybe you're aware of different avenues that might be better suited for particular researcher needs and could have workshops or you know, I don't know, information sessions or emails or something that could be sent out like, 'Hey, look at these, you know, technologies that might be helpful.'

Another researcher simultaneously addressed both their need for help along with a potential suggestion for assistance:

“So if there were a pipeline that we could just submit our data to, and then either automatically or somebody takes that data and puts it into the right format and gets it onto the right servers or wherever it's going, right-- right repositories, that would be ideal. Short of that, just having somebody that is familiar with the type of data that we generate and what mechanisms are out there, just to provide access to someone with some experience or expertise in that area would be good.”

Uncertainty about Planning and Best Practices

Of the participants, thirteen explicitly mentioned at least once feeling uncertain about the best practices for managing their data. One participant who expressed confidence in the university's infrastructure acknowledged that even knowing where in the university to store data could be a challenge. They wanted more information about the pros, cons, and standards of using different university resources for storage.

Other participants simply seemed content that their approach worked well enough, even if there may be methods for doing things better. Reminiscent of this attitude was the statement:

“I mean, honestly, I don't know. I mean, I'm not necessarily a big computer guru, so I try to keep it as simple as possible. I mean, there may be better ways that I just haven't been exposed to. So, I guess I don't really have any better answer to the question. I mean, for now, Excel is doing the job. Yeah.”

When one participant was asked about using their college's IT personnel for help, they stated:

“Yeah. If there's a specific thing I'm having trouble figuring out, or I'll ask other colleagues. I have not gone to the library, but I mean, some of the things I brought up, I need to do better at in terms of data organization and storage. I don't know. I need to have better plans in place.”

Awareness that technology has already changed and will continue to change also increases uncertainty among participants. Five explicitly expressed concern that they are unsure what to do or where to go even though they know these changes may pose a problem in the future. One participant explained:

“And the storage places are changing from all of these hard drives to the cloud and wherever they go. So the concern I have is (in) the near future (when you can't) read these hard drives on computers then where do you go?”

Perhaps a surprising aspect of this issue is that more participants did not express concern about changing technology rendering their data inaccessible in the future. The majority of participants seemed content to rely either on their hard drives and/or cloud products like Google Drive or Dropbox for sharing and storing data. At the same time, while it seems likely that changes in data storage will continue to occur, it could be that participants are willing to just cross the bridges of change when it becomes necessary. One participant expressed an understanding that no data storage option will ever be foolproof when they said, “What's the procedure of storing

the data because with data there's nothing that's a 100% proof, right?" The lack of concern expressed by other participants may indicate that they, too, are similarly resigned to this reality.

Help from Research Support Staff and Student Assistants

Although interviewers asked faculty specifically about their own challenges with data storage issues during the course of a project, three participants mentioned that they rely on research staff to help with the project management portion of their work. As such, participants did not always face these challenges personally. When asked if it worked well to use a database with 30 other people contributing, one faculty member said, "It does, but again, it's mostly because I've got a good data coordinator who cracks the whip and makes sure that people's names are files and blah, blah, blah." The participant fully admitted that they would have to check with the project manager about which server even housed some of their long-term stored data. Pressed for details on what kind of back-up protocols were in place, they simply said, "I don't know what we've got going."

All but four of the participants discussed their work with students, especially graduate students, on data collection and/or data management. One researcher described taking advantage of graduate students' skill sets and expertise when needed:

"Graduate students, it's kind of their livelihood, right? Is to know how to fix the software, right? Or the file format, or into converting something, or they need to do something with R. They have more time than I have to go look it up and figure it out and try it and-- There is, in my case, I hate to admit this but there is a generational difference. I mean, this stuff is pretty much second nature. And I think that a lot of these incoming graduate students have a-- well, they're certainly younger than my youngest child and they were born in about the year that I showed up here. And so, this is all normal for them. Very normal. They're not intimidated by anything, they kind of have the intuition for it. We knew that it was going to turn out this way when Apple quit sending out manuals."

Help through University Service Centers

Beyond needing assistance for gaps in their own knowledge, many participants also discussed needing university resources and expertise to manage, use, and analyze their data. Although two participants indicated that they typically dealt with data technology issues on their own, fourteen participants described using the campus's Information Technology Services (ITS) department, as well as university service centers, for help with technology assistance and computing infrastructure. While participants expressed their appreciation for such services, some difficulties were mentioned as well. One participant offered a very specific example and highlighted the challenges that can occur when seeking help from other entities within the university:

"So one particular challenge about six years ago, my predecessor got some funding, about \$10,000 worth and worked with an IT company in [geographic location] to develop the app for [our] program - for uploading those data. Yes. This app was supposed to mesh neatly with a national database...[and] It was supposed to mesh neatly with [a data repository]. About a week ago, maybe a

little more than a week ago, the app quit working...I emailed and said, 'Hey. What's up? This isn't working.' And they had done an upgrade on whatever--platform some sort of an IT upgrade. Well, it left my app behind. It wasn't compatible. So, he had to go back and use that for my app. And then he asked me, 'Is this something you still use?' And unfortunately, it is. It is my primary method for getting my...data uploaded into [the national database].”

Another researcher offered emphatic praise for the university's data centers. When they need help, they know where to ask for it:

“They are very customer service orientated. They're there to help you out so if you have an issue they will fix it for you or tell you how to fix it. Same goes for [a staff member]. If I have an issue with files, formats, whatever, you go, 'How do I get a terabyte of data from here to here without problem?' Whatever the question is they do it.”

The university library was not left out when participants described their “go-to” entities on campus for assistance:

“I hope this doesn't feel like pandering, but I mean, the library is often a source I've come to and can. I find the library is an important resource in that because of the strange position I think faculty librarians find themselves in, in parallel with the disciplinary scientists. So, here, [a service center based in the library] has been a big piece of that. Aside of that, I feel that there isn't as much as people say that there is a mentoring structure and institutions, I don't find that the mentoring structure has been particularly helpful for specific kinds of problems. It's a bit hand-wavy. And this has been true for five, six different institutions I've been to that it's nice to have mentoring in theory and practice. Even at the graduate student advisor level, that's really hit or miss. So, I mean, I guess I maybe I know some people across campus, but in terms of an actual resource, I actually think the library is a pretty critical one.”

While this type of assistance is obvious to established researchers who have a relationship with centers or other university resources, another participant noted that it is not always clear whom to ask for help, even within the university's sphere.

Discussion

After being inspired by the existing literature on help-seeking behavior and observing that our findings reflected these strategies, we designed a “help-seeking matrix” that delineated behavioral strategy (instrumental or executive) by the locus of support (internal or external) that was necessary for a research team or lab to achieve their goals (see Table 1 for an example of how a faculty researcher's behaviors could be categorized within this matrix). When attempting to solve a problem or supplement skill/knowledge gaps, instrumental behavioral strategies involved pursuing or providing opportunities to develop self-sufficiency and mastery, while executive strategies involved partnering with others and relying on their expertise to fill these

gaps (Black 2016). Internal support involved help-seeking behaviors that were related to a faculty researcher’s own area of authority (e.g., providing training for team members or hiring support staff), while external interactions required a faculty researcher to seek support outside this area (e.g., attending a library workshop or forming a partnership with a service center). Re-examining our transcripts based on this matrix revealed that faculty respondents, overall, exhibited a fairly consistent bias towards executive help-seeking behaviors, while instrumental behaviors seemed to stop at merely information gathering or wayfinding.

Table 1. Examples of behaviors relative to the type of support

	Internal*	External
Instrumental Help-Seeking	<p>Reciprocal apprenticeship through faculty/student relationships</p> <p>Training for members of a lab or team</p>	<p>Utilizing workshops, courses, and other resources provided by the university (e.g., university library workshops)</p> <p>Utilizing workshops, courses, and other resources outside of the university (e.g., a workshop at a professional society’s annual meeting)</p>
Executive Help-Seeking	<p>Hiring research technicians and other staff to do research data management</p> <p>Delegating data management tasks to student assistants</p>	<p>Using service centers or core facilities (e.g., university IT or computing services)</p> <p>Formal collaboration with peers, esp. Interdisciplinary or sub-disciplinary</p>
*Internal to a researcher’s area of direct authority.		

An executive help-seeking strategy was also apparent in respondents’ reports of relying on peers, colleagues “down the hall,” and others as a means to understand where to get help. A few extended this notion of help to the creation of formal collaboration itself, with several faculty noting that in order to achieve assistance with data management, they needed to work with others who were experts in managing (and processing) other data types. In these instances, it was unnecessary for a faculty researcher to learn how to manage data outside their own area of authority, such as remote sensing data, because it was more productive and effective to work with a remote sensing specialist and enlist their (assumed) data management expertise. This is one way to bridge the notion of help with the interrelated notion of collaboration. Our findings showed that, for faculty researchers, collaboration was often a form of externally-oriented executive help-seeking, which was intended to create a positive and productive, but also dependent, relationship.

Researchers who described challenges with uploading data to repositories exhibited divided help-seeking approaches. While several in our study reported no problems with this process, others mentioned that it was difficult and time consuming. However, those who reported no problems were the same faculty researchers who had established an executive help-seeking approach and had hired staff or partnered with other groups, like the university’s genomic

resources center. Respondents with limited experience and without internal or external support may see these challenges as a reason to wish someone else could just take care of it, as did one of our participants. Others clearly felt that it was their responsibility to manage the repository submission process, but they did not report seeking opportunities to develop their skills.

The faculty participants in this study acknowledged that having research support staff available to help during the research process is part of the reason why *they* did not need more assistance with data management. Although understudied in the context of data management ([Goben & Griffin 2019](#)), research by Westra ([2009](#)) found that this reliance on research support staff means that they often have just as much need for assistance with data management as faculty researchers do. Our study seems to support this contention, given that interviewed faculty rely heavily on support staff for research processes.

In the context of overall data management, file organization, workflows, and managing people involved with the project were more substantial challenges than depositing data into repositories. Similar to what Wiley and Burnette ([2019](#)) discovered, these aspects of data management also presented problems to faculty in the current study. Faculty did not necessarily discuss these in the context of help-seeking, likely because one might not even know that problems of this nature exist until they arise. Indeed, faculty reported learning the hard way that these issues must be addressed rather than reporting that they had sought help to address them. The implications, however, are that faculty might have welcomed a heads-up for some of these challenges. While Goben and Griffin ([2019](#)) suggest that this type of knowledge is usually learned through enculturation within a research environment, this may be an area where librarians could take the initiative and provide resources on project management to students and new faculty.

These challenges validate the possibility that library services that facilitate access to guidance are helpful, not just those services that perform data management tasks. Indeed, the core notion behind Taylor's ([1968](#)) Conversation Theory is that patrons of library services often lack a complete understanding of the questions they are trying to answer. The point, in Taylor's view, is to challenge the patron into a point of criticality, helping them question their own information need until they find resolution in the answer. From this logic, the researcher who knows that they are not satisfactorily engaging in data management must have access to different approaches and techniques that are facilitated with them, with increasing levels of self-sufficiency. Our interviews reveal that in numerous cases, faculty do not exhibit the confidence that they have "solved" their data management issues, unless they have delegated them away to someone else. Rather, their uncertainty persists and will likely persist, much like any other person seeking assistance.

When discussing their instrumental help-seeking behavior, participants did not typically mention seeking out librarians (nor were they prompted to tell us if they were). Their colleagues and the internet were usually mentioned as their go-to sources for help. However, Mullen et al. ([2008](#)) identified that faculty may not have available in-house mentors or department chairs to approach for help, while some of the participants in this current study also relayed their attempts and failures to form helpful relationships with colleagues at a nearby university and the lack of mentorship in their department. The internet becomes a key tool for assistance when faculty are unable to find close colleagues, especially given its accessibility and relative anonymity for those engaging in help-seeking behaviors.

Likewise, as highlighted by Monroe-Gulick et al. (2017), faculty also report seeking assistance from collaborators, both other disciplinary experts as well as their own graduate students. The fact that participants in this current study described challenges helping their graduate students with data management, while at times also struggling to identify appropriate tools for sharing with colleagues, suggests that faculty may appreciate outreach, programming, or publicity for services related to research and data management that is both directed toward, and available to, their collaborators. Thus, it may be helpful to consider delivery platforms that are accessible not just to current faculty and students, but also collaborators from other universities as well as previous students who have moved on or graduated but may still be working with their former professors.

Recommendations and Future Plans

Our findings indicate that when some faculty were in need of help, they were unable to identify where to go on campus for assistance or who to contact. While this is a problem for our university and its lack of marketed services, it validates the idea that there is a need for a wayfinding role for libraries. At our institution, this has initiated a process of establishing a staffed service point that seeks to provide this support. We have identified an area of our building that, with some minor enhancements, can facilitate a data services service point where we can centralize the support for both the wayfinding and advisory services. This also gives us a branded service around which to begin marketing specific sub-services, such as data management plan consultation services or data storage and backup advisory services, focused on connecting researchers to best practices and institutional resources to support their needs.

Faculty members' prior help-seeking strategies demonstrate that they are interested in support that helps them and their research teams seek out and learn practical skills, strategies, best practices, and information, as well as facilitate connections with institutional experts. Smaller libraries, without intensive collaborative resources to offer, may need to target audiences in different ways. Meeting the needs of those faculty with executive help-seeking strategies may be challenging for smaller institutions without as many resources, centers, or experts to connect faculty to. Arguably, smaller libraries may have embraced a train-the-trainer approach, by offering workshops in perceived areas of need, when instead many researchers are seeking to be connected to collaborators who will take on technically intensive work. Our strategy is to not try and be all things to all people. Without an internal library technology unit, our library does not maintain high performance computing, data repository, or cloud storage services; other campus entities do. Part of the service point strategy is to include partners from these campus entities, providing a permanent "staffing point" for those units and co-locating the various resources in a single place. Those conversations are currently underway, but we have obtained agreement from some of those partners to participate.

As libraries customize data support services, including for those faculty with an executive help-seeking strategy, they will need to leverage their skills for connecting patrons to information and find new ways to connect patrons to people (Monroe-Gulick et al. 2017) as an initial step. Libraries would then need to review their own resources to ensure that they are easy to understand and simple to access. When developing research support services, libraries must also ensure that the content created as well as the approaches, techniques, and delivery formats used reflect faculty members' help-seeking behaviors and learning goals, while also providing

opportunities for faculty to become self-sufficient ([Taylor 1968](#)). Because faculty rely on graduate students and research staff in their research, it will also be important for libraries to consider the help-seeking behaviors of research support staff and/or graduate students, so they can develop and offer targeted support for their needs as well. Developing initiatives tailored to the help-seeking strategies, content needs, and delivery format preferences of these groups will be a foundation upon which sustainable research support services can be built.

Currently, we plan to address the need by explicitly reaching out to graduate students and research staff. Our resources and materials will be organized and communicated using elements of both the traditional data life cycle, but also Stodden's ([2020](#)) Data Science Life Cycle, as a strategy to map to the graduate (and in some cases, undergraduate) curriculum. Providing specific services that direct users to learning resources in support of a specific elements of the data science life cycle (e.g., Stodden's "Data Cleaning/Organizing/Merging" stage) can make the resources clearly and specifically tied to the skills students are developing in the context of the tools (e.g., SPSS, R, ArcGIS, Python) that they are using. We also plan to facilitate access to software and training resources that are otherwise unavailable without subscriptions. Following this strategy should permit our services to directly correlate to the help-seeking behavior not of faculty, but of those who are expected to develop mastery in managing research data.

Conclusion

This study indicates that researchers seek help in a variety of ways to resolve questions they encounter related to understanding technology and managing research data. Seeking help from colleagues, both inside and outside their institution, and conducting internet searches to enhance their understanding of data management and associated technologies were found to be popular solutions. Tellingly, we found that, sometimes, researchers just figure it out on their own, but are not often very satisfied with their solutions.

This study provided a foundation for rich discussion among our librarians about research support services and how best to position ourselves within the structure of the university. The data collected here, and the conversations that resulted from the data, illuminate ways the library can continue to contribute our collective expertise to enrich the broader university community.

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Appendix

Interview Questions

1. Demographic questions
 - a. What is or are your terminal degrees?
 - b. How long have you worked in an academic or research setting?
 - c. How long have you been here at the [institution name removed]?
2. What type of research do you do?
 - a. What sort of data do you produce?
 - b. File formats?
 - c. Tools?
 - d. Where do you find datasets/resources?
3. What sorts of challenges do you face in managing data during a project?
 - a. How do you store the information you collect/produce in the long term vs the short term?
 - b. What challenges do you face with storing those data?
4. How do you share data during or after a project?
5. What are your obligations to share data based on your grants, publication outlets, or departments?
 - a. If you do publish data, how do you do it?
 - b. Do you face any challenges in meeting those obligations?
6. Are you satisfied with your options for sharing or disseminating your scholarship?
 - a. Are you reaching your desired audiences?
7. When you run into the challenges discussed so far, who do you seek out for assistance or help?
8. If I gave you a magic wand that could help you with the challenges you've discussed so far —what would you do?



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