

Assessing Library Contributions and Impact across the Research Lifecycle: A Collaborative Approach

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Introduction

Beginning in summer 2019, two research libraries—the University of Washington and the University of Pittsburgh—collaborated to explore library impact on researcher productivity. This paper outlines how the two institutions partnered to develop shared research questions and methodologies as part of the Association of Research Libraries (ARL) Research Library Impact Pilot.¹ The authors will discuss lessons learned from this collaborative approach, share preliminary findings from projects undertaken at each institution, and highlight next steps for their work individually and collaboratively based on their findings.

Collaboration for the ARL Research Library Impact Pilot

ARL Research Library Impact Pilot Projects arose out of ARL's Assessment Program Visioning Task Force,² which outlined a series of recommendations aimed at aligning ARL's research and analytics work with the goals of its members. The Impact Pilots are designed to explore what a research library impact framework and agenda might look like in practice at member institutions. One of the areas of focus for the pilots is on library contributions to the research and scholarly lifecycle, an area of interest for both University of Washington (UW) and the University of Pittsburgh (Pitt) Libraries. In terms of this particular area of focus, the overarching Pilot Project Goals are to:

- Test how research libraries can work together to measure library impact on researcher productivity;
- Explore the effectiveness of collaborative approaches to impact assessment work; and
- Develop tools for measuring contribution and impact that can be used by a range of research libraries.

A call for proposals for the pilots went out in fall 2018. Both Pitt and UW were among the institutions focusing on the question of how libraries contribute to research productivity: Pitt's proposal focusing on library collections and discovery tools, the UW's concentrating on measuring and communicating research impact. The two teams did not coordinate on the proposals, but they were matched later by ARL in order to explore the question of how collaborative efforts work across institutions. There were originally three institutions connected in this project, but one of our partners needed to withdraw in late fall 2019. Being joined together in this way required both institutions to balance the local needs that prompted their initial proposals with a shared research question and methodology. In some ways, this work represents two local projects wrapped inside another larger research project.

In order to begin knitting the UW and Pitt projects together, the teams began by considering institutional commonalities and potential areas of shared interest for understanding researcher needs and library impact on research productivity. Both libraries started with a broad shared concern with library contribution to the university research enterprise and on Science, Technology, Engineering, and Math

(STEM) research in particular. Pitt ranks in the top cluster of US public research universities, and research is a major source of external funding. An indication of their current emphasis in Science and Engineering is the growth of their School of Engineering, which has doubled in size in the last 10 years. Similarly, the UW has consistently placed among the top five for total sponsored research funding for all public and private universities in the US (\$1.5 billion in 2018–19). The UW has internationally recognized research programs in the Health Sciences and STEM disciplines. While Pitt focused entirely on STEM, UW included both STEM and Health Sciences researchers in their population, as the UW Team was especially interested in learning more about interdisciplinary areas such as bioengineering.

Through ongoing discussions, the teams also identified a common focus on similar populations, specifically early career researchers in STEM and Health Sciences fields. Pitt focused entirely on faculty, while the UW included both faculty and postdoctoral researchers in their study population as this is a group receiving increased institutional focus at the UW. Both teams were curious about the ways early career researchers work: What does the future look like in terms of discovery of information and in terms of communicating research impact? What challenges do early career researchers face that libraries might be able to help them with? The teams wished to explore how well existing or potential new library services might serve the needs of this population.

Despite these commonalities, however, initially the topics for each team were on different subjects and were in various stages of conceptualization. Pitt's team was focused on collections and discovery and were interested in potentially making changes to existing resources and tools based on what they learned about early career researcher behaviors and needs. The UW was interested in how researchers understand and communicate the impact of their work. While the UW has some existing library support in this area, it is not a mature, fully developed program. The UW team hoped to explore researcher needs in this area in order to grow and develop this service.

As the teams outlined the goals for their individual projects, we began to conceptualize our overarching approach using the research life cycle as a unifying framework. We were both trying to understand faculty needs and library contributions at various points of the research life cycle, and this made sense as the lens through which to structure both projects: Pitt was focused on one of the earliest stages of search and discovery, and UW concentrated on the later stage of visibility and impact of research products (e.g., publications, presentations). With this framework, the teams then developed some shared questions:

- How does the library contribute to STEM research productivity?
- What are researcher needs and perceptions of library contributions to key stages in the research lifecycle?
- What methodologies can help us best understand and define library contributions in terms that resonate with researchers?

In addition to the focus on similar populations and a research lifecycle lens, the teams also decided to take a shared methodological approach, with some local variation (discussed in greater detail in the next sections). This enabled the teams to explore the strengths of using the same method, and also enabled them to more easily identify points of overlap and commonality in the results. Once UW and Pitt had defined the shared framework for our collaborative efforts, each group then designed their individual projects accordingly. The following sections discuss the specifics of the individual projects at Pitt and UW, including the semi-structured interview approach used for both projects.

University of Pittsburgh

The University of Pittsburgh library's approach to the call for participation from ARL's Assessment Program Task Force centered on library collections. The scholarly communication ecosystem has been

changing rapidly in recent years, and it is important for libraries to look critically at collections expenditures and to be sure that these expenditures are still meeting the needs of our researchers. Based on anecdotal evidence, the Pitt team (made up of five members with different roles in the libraries) wondered if researchers are currently relying on tools and content that they are finding freely available. One of the Pitt research questions was “Do researchers in the sciences use library subscription abstracting and indexing resources?” The high and rising costs of discovery tools in the sciences led us to focus on STEM in particular.

A recent survey of Pitt faculty also raised questions about their perception of the library’s role in the discovery process. That survey surfaced responses from science disciplines that indicated that those faculty who are new to the field do not see the library as providing subscription databases or gateway resources. So, another research question Pitt had was “What opportunities do libraries have to meet the discovery needs of early career researchers in the hard sciences?” Along with this collections-focused project idea, and in line with ARL’s goals to identify ways to measure library impact, we wanted to explore a methodology that other libraries could use as part of a toolkit for gathering information on faculty research activity. The third research question Pitt had was “Can we develop and evaluate a methodology for collecting and analyzing information about the library’s role in the research’s discovery process?” Both project teams—who used the shared methodology—hope that other institutions could use this approach to explore the needs of researchers at other stages of the research lifecycle. The next section outlines this methodology.

Semi-structured Interviews

Pitt library had done several surveys in the past, but for this project, the team wanted to get more in-depth information. We employed several principles from a qualitative research methodology portfolio. First, we used the principles of *grounded theory* research. This approach, first proposed by Glaser and Strauss, relies on the structured and iterative analysis of qualitative data through their categorization (or coding).³ Though the team had general research questions, using grounded theory freed us from defining specific hypotheses. The iterative analysis allowed the research to build as the interview process progressed. A second qualitative research principle supported the approach of interviewing a smaller population as a means to draw conclusions about a larger cohort. We relied on Guest, Bunce, and Johnson’s research to confirm that data saturation can be achieved with about twelve interviews, which helped us move forward with a very manageable number of interviews for our team to conduct and analyze.⁴

Finally, we utilized a semi-structured interviewing technique. This technique was introduced to the ARL pilot project cohort at an initial on-site meeting. The qualitative researcher and instructor from that meeting, Dr. Margaret Roller, provided additional shared training for the Pitt and UW teams in tailoring this approach to our work. Semi-structured interviewing follows a sequence of questioning described as a funnel approach.⁵ The initial questions in the interview establish a rapport with the interviewee. The teams began each interview with general questions about the researchers’ current interests and current work. The next phase of questioning narrows the focus and involves asking questions that are topic-specific. In this phase Pitt asked questions relating to faculty use of specific discovery strategies, abstract and indexing products, as well as the strategies they found most effective. In the last phase of the interview, Pitt team members asked more blue-sky questions about what faculty felt would be the most desirable situation for them in terms of discovery.

This type of interviewing relies on a set of defined questions, with the opportunity of flexible follow up as needed. For example, if a faculty member mentioned using Google, Pitt interviewers followed up and asked them about specific library subscription databases to see if they use them as well. Interviewers can follow up on any response and probe based on what they are hearing from the interviewee. The script suggests a line of questioning, not a firm list of questions to ask verbatim.

The Pitt project team had a few prerequisites for our interviewers. Firstly, the team did not recruit liaison librarians to do any interviewing, as we wanted our interviewers to be knowledgeable about library resources but not be the librarian that faculty were already interacting with. This helped to achieve the aim of putting interviewees at ease and enabling them to feel that they could tell us anything and that the interviewer would not be offended by a “wrong” answer (in a number of instances faculty did mention with chagrin that they did not use databases that liaisons had told them about). Also, the Pitt team wanted to ensure that interviewers were comfortable with the semi-structured approach and the flexibility it may require. The interviewers needed to be very engaged in the discussion and use active listening skills to keep up with the thread of the conversation. Though this is more difficult than reading a list of standardized questions, this technique did elicit many unexpected but clearly explained responses from interviewees.

Data Analysis

The Pitt team did not have much experience with formal coding of qualitative data, which influenced decisions about how to analyze our results. The team’s first approach was to outsource the transcription work. This was beneficial, since staff time was limited. The transcriptions were completed in 24–36 hours, and the cost was reasonable. The team discussed using software tools to help code the data but decided to do this process manually. All members of the project team reviewed a single interview as a sample. The team then met, discussed the experience, and identified preliminary themes. Then each member independently coded all the interviews, and the team then met as a group to discuss our findings. In this way we all had an in-depth understanding of the interviews. As noted previously, team members were from different units in the library, and each member brought different expertise and perspectives in identifying and discussing the themes that emerged. This also allowed flexibility in identifying the key topics as we reviewed quotes from the transcripts.

Preliminary Trends and Results

While synthesizing and reporting our findings is ongoing, the Pitt team has identified a number of important trends and learned a great deal from the nuanced information we gathered. One trend was the frequent use of Twitter by faculty as part of their research process. The Pitt team was prepared to hear that researchers use Google frequently, which was confirmed in the interviews. What we had not expected to hear was that many use Twitter regularly. The researchers explained their use of Twitter by sharing several important ways they use it:

- Twitter provided a timely way for them to get information.
- They followed authors that they knew worked in the same field of study
- They followed output for specific research labs active in their field
- They observed the way research is framed for the general public.

A second unexpected trend the Pitt team discovered was that researchers were not compartmentalizing their discovery work as a specific, discrete step done early in the research lifecycle. The team had not anticipated the amount of time researchers devote to it. All interviewees saw discovery as an ongoing, constant activity that they need to engage in in order to keep up with other research in their field. Faculty might employ different discovery techniques based on where they are in the research life cycle—for instance when they are writing a grant versus finalizing a paper—but the process is one they do constantly. As one faculty noted about the continuous discovery process: “There is never enough... There is never a stop.”

Interview results have enabled Pitt to move forward with some database cancellations and are informing the investigation of ways to improve access to our subscribed content. As a result of participating in the ARL Pilot Project, the team at Pitt not only learned a great deal about researcher discovery behaviors and

needs that will continue to guide changes, but also about the gathering and analysis of rich qualitative data. After the interviews with Pitt faculty were completed in spring 2020 and the data analysis and reporting undertaken in summer/fall 2020, Pitt team members then began collaborating with partners at UW Libraries to explore shared themes and lessons learned from each individual project, and the collective work as a whole.

University of Washington

Prior to participating in the ARL Impact Pilot Project, the UW Libraries had undertaken a survey to learn about STEM and Health Sciences researcher needs and priorities.⁶ We learned that assistance with measuring and communicating research impact was a top priority. In order to learn more about what this meant, the UW Libraries project team developed this qualitative project to delve deeper into a set of core questions:

- What are faculty and postdoctoral researcher needs for understanding and communicating the impact of their work?
- How do STEM and Health Sciences researchers define impact, and what are their priorities for research impact support?
- How might we understand the impact of existing services on research productivity?

Methodology and Data Analysis

The UW Libraries project team interviewed 19 early career faculty and postdoctoral researchers in late winter/early spring 2020.⁷ The UW took a similar semi-structured interview approach to that used at Pitt, with one important difference: the UW team provided each interviewee with an example Research Impact Report. Team members selected one article for each interviewee and created a report highlighting metrics and contextual information from sources such as Web of Science, Google Scholar, and AltMetric. These types of reports had been provided to faculty on an ad hoc basis in the past, but we were curious to see if this approach met our users' needs. Interviewers provided the report in advance of the interview and then discussed it with the interviewee to get their feedback. This approach enabled us to uncover in more concrete terms the kind of information researchers are interested in gathering, and how they wish to present it for specific purposes such as grant applications and promotion and tenure files. The UW Libraries team transcribed the interviews and took a similar inductive coding approach to that used by Pitt, but UW used NVivo software to code transcripts, conduct data analysis, and generate reports. One significant methodological difference between Pitt and UW was that Pitt conducted all interviews in person. The UW team began by conducting interviews in person but switched to online when the UW moved to remote operations in March 2020 as a result of the COVID-19 pandemic.

Preliminary Trends and Results

Despite the rapid change to online interviews, the UW project team gathered rich insights about faculty and postdoctoral needs relating to research impact measurement. Our results highlighted a number of key areas for attention. While interviewees found the research impact report useful, for example, they also indicated the importance of going beyond simply providing counts to offering context and meaning for metrics. Interviewees consistently expressed the need for support in translating metrics into compelling narratives, particularly in considering the impact of interdisciplinary, public, and community-engaged research.

Interviewees also noted the need for support with increasing the visibility and impact of their research through both traditional and social media. Twitter was mentioned in most of the interviews as a tool for discovery and keeping up to date, building networks, and increasing visibility and impact. However, there was a consistent theme of researchers often being on their own in terms of figuring out how to establish

online profiles and the best ways of using social media for research visibility, as this quote from one of our interviews highlights: “I can go to Twitter and just scroll through my feed and it’s all my professional updates for the day.... I think it’s a really easy way for me to keep my own school leadership involved in what I’m doing since they get tagged in everything I post about my work. It’s a process of learning how to use Twitter, be good at tweeting. Still learning that process. Learning the high impact hashtags...”

The UW Libraries team, working closely with partners in the libraries and the university, have begun to implement changes based on our findings. This includes additional outreach and support to postdoctoral researchers on the topic of understanding and communicating research impact. As a result of this project, a team member was recently invited to present a session at an annual UW postdoctoral conference on this topic, a first step in helping these researchers establish practices that will serve them well as they build their careers. Additional resources are now being piloted with selected groups of faculty, including an online guide and a checklist researchers can use to make sure they are maximizing their use of various impact tools and resources. Lastly, programming and events focused on research impact are being added to existing libraries events, specifically those focused on open, interdisciplinary and public scholarship.

Lessons Learned about Collaborative Assessment Work

Although it was challenging at the start to merge projects that were initially proposed separately, there were a number of benefits from taking this collaborative approach. One important benefit of our collaboration was that it helped both teams to define our scope, terms and methods in ways that could be applicable beyond our local contexts. For example, the UW and Pitt teams needed to devote time to developing a shared understanding of what we meant by “early career” and why this focus was particularly important for our work (and perhaps to research libraries generally).

In addition, insights from colleagues’ use of methodologies and data analysis helped to make both projects stronger. Being able to take a shared methodological approach and to coordinate the interview guides and analysis was extremely valuable: UW and Pitt coordinated to use similar opening questions in our interview guides to learn about interviewees’ research interests and current projects. This means that as our shared work progresses the teams will be able to look across the two projects for additional common insights about how interviewees talk about their research at various stages of the research lifecycle. The teams are already seeing the ways in which this shared approach is yielding mutually beneficial results. One preliminary commonality emerging across the two projects, for example, is the use of Twitter as a way not only to raise the visibility and impact of research, but as a key discovery tool for researchers. Without the collaborative process, the UW team might not have paid as much attention to thinking about researchers’ use of Twitter holistically. Because we knew this was an emerging theme for Pitt, UW created a code for discovery that enabled us to see how social media plays a role for many in the entire research lifecycle. This, in turn, is likely to help inform our strategies for developing new services as we move forward.

This collaboration project was extremely beneficial to both institutions, and both teams learned a great deal about doing this collaborative work successfully. A key element of success is defining shared definitions and parameters for our work at the start of the process. In addition to the example of defining “early career” mentioned above, the teams also needed to define which fields were included in STEM at each institution, and how to handle interdisciplinary areas such as bioengineering. There were also varying levels of maturity for different services we were exploring and readiness to assess the impact and contribution of these services to research productivity. Spending time at the start of the project to understand readiness to engage in assessment work for library services in various stages of development is valuable. This can help surface unique sources of expertise and specific resources that can be leveraged across teams.

The ARL Research Library Impact Pilot: Next Steps

The teams will continue to compare findings across our institutions to gain insights into faculty needs, our methodology and its limitations, and the collaborative approach to assessment across research libraries. The teams will finalize a shared report for ARL in spring/summer 2021, which will include sharing interview guides with the wider library community.

One of the most important next steps is to continue work with ARL to explore how we might translate what we learned into alternative measures to understand the difference libraries make to their institutions, and how these measures might be used across a range of research libraries. While one of the goals of the ARL Research Library Impact projects is to “develop tools for measuring contribution and impact that can be used by a range of research libraries,” the qualitative assessment projects at UW and Pitt Libraries were exploratory and did not necessarily yield new tools for measuring library contributions. The goal of both projects was to better understand the needs of researchers, and the qualitative approaches we used provided rich insights into what early career researchers need and what *they* value in terms of support at various stages of the research lifecycle. This approach enables the teams at UW and Pitt (and perhaps the research library community more broadly) to ask: How do we translate what researchers value—and how they express what they value—into indicators of what we measure? The hope is that this provides the foundation for translating this qualitative work into measures and tools that can be used across institutions to give libraries insights into their contribution to research and scholarship.

Endnotes

- ¹ “Research Library Impact Pilots,” Association of Research Libraries, accessed December 21, 2020, <https://www.arl.org/research-library-impact-pilots-2>.
- ² “ARL Assessment Program Visioning Task Force Recommendations,” Association of Research Libraries, accessed December 21, 2020, <https://www.arl.org/resources/arl-assessment-program-visioning-task-force-recommendations/>.
- ³ B.G. Glaser and A.L. Strauss, *The Discovery of Grounded Theory: Strategies for Qualitative Research* (Chicago: Aldine, 1967).
- ⁴ G. Guest, A. Bunce, and L. Johnson, “How Many Interviews Are Enough? An Experiment with Data Saturation and Variability,” *Field Methods* 18, no. 1 (2006): 59–82, <https://doi.org/10.1177/1525822X05279903>.
- ⁵ See M. Roller, “Qualitative Research Design: Selected Articles from Research Design Review Published in 2015,” last modified January 2016, <http://www.rollerresearch.com/MRR%20WORKING%20PAPERS/Qualitative%20Research%20Design-2015.pdf>.
- ⁶ J. Belanger, M. Faber, and S. Hiller, “Understanding STEM faculty and graduate student needs: research workflows and library impact,” in *Proceedings of the 13th International Conference on Performance Measurement in Libraries* (2019):185–192, <https://libraryperformance.files.wordpress.com/2020/06/libpmcproceedings2019.pdf>.
- ⁷ The UW Libraries project team is composed of librarians with various areas of expertise, including assessment, research impact, and STEM and Health Sciences subject fields.