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# Building professional development opportunities in data services for academic librarians

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## Recommended Citation

# [H1] Building professional development opportunities in data services for academic librarians

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[ABKWH] Abstract: Research data management (RDM) represents a significant professional development area for academic librarians - significant for its growing importance to the profession, since researchers are increasingly expected to comply with RDM requirements, and for the extent of competence needed by librarians to support researchers in RDM practices and plans. This article recounts how the Association of College and Research Libraries (ACRL) is fostering professional development opportunities in RDM. The authors describe two key endeavors: 1) the development and deployment of a needs assessment survey, which allowed insight into the types of librarians expressing the most need; and 2) planning and implementation of a pre-conference workshop for ACRL 2015, intended to prototype a future professional development offering. The article concludes by discussing additional assessment that was done following the workshop and how the pre-conference lay the foundation for proposing a "roadshow" for RDM, similar to what ACRL sponsors for scholarly communication.

Keywords: Data management, academic libraries, professional development, professional organizations, data services

## [H1]Introduction

[TEXT]Academic libraries have responded to changes in scholarly communication in myriad ways. Shifts in that landscape include the proliferation of data as a scholarly

product and various funder requirements regarding the management of that data. Members of the Association of College and Research Libraries (ACRL) in the United States of America have responded to these changes through a series of developments, aimed at providing sustainable professional development support to librarians in the area of research data management (RDM).

[TEXT IND]The authors are engaged in various organizations that concern RDM, such as the United Kingdom Digital Curation Center Associates Network, Research Data Alliance, the International Association for Social Science Information Service & Technology, the Digital Library Federation, and the Association of College and Research Libraries (ACRL), have presented and published on the topic (Shorish, 2015; Reisner et al., 2014; Whitmire, 2015, 2013; Hswe, 2015; Hswe and Holt, 2011), and three of the four authors have served on the Executive Committee for the ACRL Digital Curation Interest Group. Through these broad experiences and associated perspectives, the authors formed the hypothesis that subject liaison librarians are an underserved population with respect to RDM professional development. Literature in the field gave support to this hypothesis (see Literature Review). Survey assessment can direct professional development efforts and ensure that scope and purpose are derived from the best evidence available. This article details the strategies employed, including surveys, to develop a sustainable and targeted RDM professional development opportunity for academic librarians, with a focus on liaison librarians, which may have utility for other library and information science professional organizations, globally.

## [H2] Literature review

[TEXT IND] Most researchers have not been formally trained to manage their own data. In 2010 Borgman declared that the "data deluge" had arrived; she estimated that 90% of the world's data had been created in the two years preceding her publication. Little (2012) acknowledged the struggles that academic libraries face in keeping pace with these trends, yet Scaramozzino, Ramirez, and McGaughey (2012) claimed that assisting faculty with their research data needs can be a growing role for university libraries. Nicholson and Bennett (2011) emphasized the library's role in the "scholarly enterprise" as a bridge between researchers and institutional repositories to make data management part of library managed repositories' processes and goals.

University libraries such as those at MIT, University of Wisconsin-Madison, University of Edinburgh, and University of Southampton are offering web-based guidance on best practices to researchers. Some groups or libraries, including the University of Minnesota and the California Digital Library, provide workshops on data management, individual discussions or consultations, or other outreach activities. Many libraries are using their institutional repositories as a place to house research data and fulfill grant requirements including examples from ScholarSphere at Penn State, Purdue University Research Repository (PURR), and Cornell University's DataStaR. Librarians are currently being trained to manage data as well, i.e. University of Illinois has a Data Curation Education Program, University of Tennessee is a partner in the Data Curation Education in Research Centers program, Syracuse University has an eScience librarian track, and the University of North Texas offers a program called Information: Curate, Archive, Manage, and Preserve.

The DuraSpace/ARL/DLF E-Science Institute is a program that was developed to help libraries create a strategic response to e-research support needs and involves a small team of individuals, including a library administrator, a data librarian, and a non-library participant (Duraspace, n.d.). Outside of an institution, regional "science boot camps" have been developed to aid science liaison librarians in keeping abreast of the changes in the field, which often includes some RDM component. The most long-running of these is the New England Science Boot Camp (e-Science Portal for New England Librarians, n.d.). DCIG offers professional development opportunities to support these new emerging roles for practicing librarians and archivists through its spring webinar series and programming at ALA Midwinter and Annual conferences (ALA Connect, n.d.).

The roles of assisting with the management and curation of research data are frequently falling under the library's purview despite limited training opportunities and ever evolving best practice. Heidorn (2011) cited a need for librarians to pursue training in data curation and e-science, since existing skill sets leave them well positioned to assume duties in this area. Several articles and reports have been written that indicate liaison librarians are a target audience for RDM training (Cox et al. 2012; Jaguszewski and Williams, 2013; Rockenbach et al., 2015). Some programs, such as at Purdue University Libraries, have gained more traction within their campus communities (Witt, 2012, 2008), while other teaching-focused institutions may still be wondering how to tackle or even understand the greater issues. Engagement in this area is also relevant for undergraduate institutions. Shorish describes the importance for teaching-focused university libraries as well to provide education, services, or consultation on research data management and curation (Shorish, 2015, 2012).

Library support for research data management is an international endeavor, as evidenced by various professional organizations across the globe. The Association of European Research Libraries (LIBER) has indicated that "Support[ing] the development of skills in RDM" is an aspect of its Scholarly Communication and Research Infrastructures Committee Strategic Priority #1: Enabling Open Science. One mechanism planned to meet this goal is the development of modules addressing policy and training (LIBER, n.d.). The Australian National Data Service (ANDS) works with several university libraries, such as Monash University and Australian National University, to provide resources on research data management. While many of the local tools are aimed primarily at the researcher, ANDS launched "23 (research data) Things" (Australian National Data Service, n.d.) in 2016 to aid librarians and data managers in building knowledge and skills related to research data management. The Canadian Association of Research Libraries (CARL) launched the Portage initiative as an attempt to bring together RDM knowledge into an information network across Canadian research libraries (Canadian Association of Research Libraries, n.d.). Additional educational efforts captured by RDA's Education and Training Interest Group (RDA Education and Training Interest Group, n.d.) indicate the wide range of education efforts internationally, although the list is currently populated by almost exclusively English-language activities.

# [H1]Background

[TEXT IND] In 2010 the ACRL Board of Directors approved the formation of an interest group that would, in part, "sponsor discussions or programs that share the ways in which libraries are working to meet the needs of curating a variety of content in digital form" and "to inform and educate librarians on digital curation trends and new technologies . . . and to collaborate with other organizations within the library profession and academe on issues concerning digital curation" ("Creation of ACRL Digital Curation Interest Group," ACRL Board of Directors Action Form, 2010). The librarians who founded the Digital Curation Interest Group (DCIG), Patricia Hswe and Marisa Ramirez, purposely selected a name that would allow versatility in terms of what is submitted to methods of digital curation for the goal of meeting long-term preservation, access, use, and reuse needs. The DCIG held its first online meeting in 2011, convened in person for the first time at ALA Annual in 2012, and from that point onward has grown in membership to include more than 900 information professionals (ALA Connect, n.d.).

Not unimportantly, the same year that the DCIG was formalized, the United States National Science Foundation made official its data management plan (DMP) requirement for grant proposals to the agency. The DMP mandate and academic libraries' responses to it became topics that the DCIG quickly saw in its purview to address, especially when no other group or committee in ACRL, at the time, seemed a plausible "home" for such issues. Management of content and data aligns logically with digital curation practices. The robust attendance of webcasts hosted by the DCIG in 2012-2014 also evidenced librarians' growing interest and engagement in data management. "Collaborative Data Management Services at the University of California," "Creation of an In-House DMP tool at the University of Houston Libraries," and "Practical Data Management" were just a few of the presentations that regularly drew almost maximum attendance.

In its first few years of implementation, then, the DCIG was clearly filling a perceived gap in professional development opportunities in research data management (RDM). Moreover, when the DCIG started, although professional development opportunities dedicated to RDM had begun appearing, such as the Research Data Access and Preservation Summit (RDAP), there were still fewer offerings in RDM for subject liaison librarians, such as in the sciences. In 2013 ACRL leadership requested that its Research and the Scholarly Environment Committee (ReSEC) begin working with pertinent groups, including the DCIG, the Digital Humanities Interest Group (DHIG), and the Intersections of Scholarly Communication and Information Literacy Task Force, on determining the kind of support in RDM that ACRL should be providing its members. For instance, should there be a roadshow about RDM, similar to what the organization sponsors for scholarly communication (Association of College & Research Libraries, n.d.)?

ReSEC devoted a portion of its 2014-2015 work plan to exploring professional development in RDM, and in early 2014, in collaboration with the other groups, the committee presented a set of recommendations to the ACRL Board. Two recommendations concerned data information literacy support, which the Board did not approve largely because of already existing efforts. Three recommendations addressed RDM support, which the Board did approve. These included the planning and coordination of a pre-conference workshop for the 2015 ACRL Conference in Portland, Oregon; the addition of information about data management to the ACRL Scholarly

Communication Toolkit; and deployment of a survey to DCIG members in order to determine their needs and suggestions for data management.
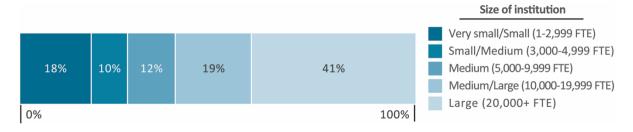
# [H1]DCIG survey methodology

[TEXT IND]Acting on the recommendation to the ACRL Board, the Digital Curation Interest Group (DCIG) Executive Committee designed a professional development needs survey for its members via a 13 question survey. The survey included seven multiple choice questions, three multiple selection questions, two free-text responses, and one question asking participants to rank the importance of certain types of professional development opportunities in research data management. Since a few questions referred to the terms "research data management" and "research data curation," these terms were defined at the onset of the survey. Assistance with survey design came from the Institutional Research Office at James Madison University, senior staff at ACRL, and the director of ALA's Office of Research and Statistics. The survey was administered through Qualtrics and all responses were anonymous. A copy of the survey has been included in Appendix 1.

The subject group for the survey included librarians, library staff, administrators, and other personnel involved in, or interested in becoming involved in, the management and curation of research data at their institutions. The survey was emailed to 926 members of the Digital Curation Interest Group on July 8, 2014 and closed on July 31, 2014. With a confidence level of 95% and a confidence interval of seven, 162 responses would have been needed for statistical significance. After one reminder was sent to the interest group members on July 24, 2014, a total of 195 responses were received (a response rate of 21%), which surpassed the threshold for statistical significance.
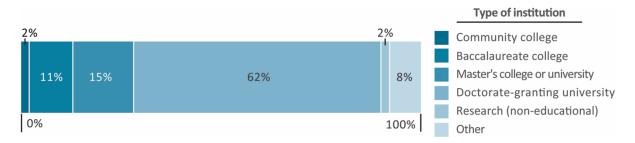
## [H2]*Survey results*

### [H3]Demographics

Survey participants were asked two multiple choice demographic questions at the start of the survey to determine the size of their institutions and the type of institution at which they were employed. Most respondents (60%) were employed by large institutions with 20,000+ FTEs (41%) or medium to large institutions with between 10,000 and 19,999 FTEs (19%). The remaining 40% were split between medium institutions with between 5,000 and 9,999 FTEs (12%), small or medium institutions with 3,000 to 4,999 FTEs (10%) and very small or small institutions with 1 to 2,999 FTEs (18%).



Size of institution
- Very small/Small (1-2,999 FTE)
- Small/Medium (3,000-4,999 FTE)
- Medium (5,000-9,999 FTE)
- Medium/Large (10,000-19,999 FTE)
- Large (20,000+ FTE)

[CPB]Figure 1: Institution Size of Survey Participants

Most survey respondents (77%) were also employed by doctorate-granting universities (62%) or master's colleges or universities (15%). Baccalaureate colleges represented the next largest group of respondents (11%) and non-educational research institutions and community colleges were each represented by 2% of survey participants.



[CPB]Figure 2: Type of Institution of Survey Participants

Survey participants also had the option of entering another type of institution; 8% reported employment from a type of institution not represented in the survey options. These included a research library and museum, a law school, a non-academic research library, private institutional archives, two public libraries, someone in distance education, as well as someone from an academic library consortium.

Respondents were also queried regarding their current or anticipated roles in their institutions with the option to multi-select responses. A plurality were liaisons/subject librarians (42%). Other roles were split amongst the remaining respondents, who reported roles as administrators (22%), scholarly communication or digital repository coordinators (20%), data specialist or data services librarians (18%), and archivists and special collections librarians (16%). 18% worked in other roles including librarians focusing on metadata, public services, technology, digital preservation, cataloging, special projects, digital media, digital initiatives, digital scholarship, e-resources, and collection development; interns; library technicians and clerks; specialists in digital humanities, data management, and visual resources; as well as faculty at an iSchool.

[H3]Expertise

The next three questions queried participants about their expertise and comfort levels with research data management topics, including how they rated their current expertise with research data management, their expertise with research data curation, and their level of preparation to engage in research data management activities at their institutions. Most participants seemed hesitant to rate themselves as experts in research data management: 65% of respondents indicated that they were completely new to the field (21%) or had limited experience in the field (44%); 35% claimed that they were intermediate experts in the field (33%) or were experts (2%). This lack of confidence increased with respect to research data curation; 78% claimed to be completely new to the field (30%) or had limited experience in the field (48%). Only 22% felt that their skills were intermediate (20%) or expert-level (2%). Overall participants seemed to rate

themselves as having limited expertise in both research data management (with a mean of 2.16 out of 4) and research data curation (with a mean of 1.94 out of 4). Participants also lacked confidence about their abilities to engage in research data management activities at their institutions; on a scale of one to five, with one representing "very unprepared" and five representing "very prepared," participants tended to rank themselves between "somewhat unprepared" and "neither prepared nor unprepared," with a mean of 2.91 out of 5. Fifty-five percent of respondents felt either "very unprepared" (18%), "somewhat unprepared" (27%), and "neither prepared nor unprepared" (10%). Forty-four percent felt they were more equipped to interact on the topic of research data management on their campus, while 34% felt "somewhat prepared" and 10% felt "very prepared."
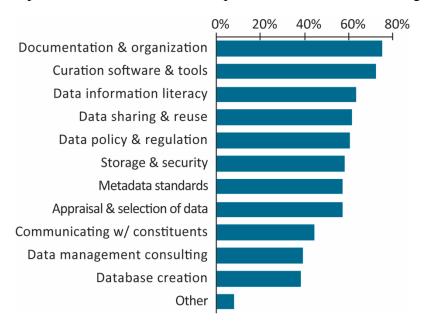
### [H3]Institutional Approach

The survey included an open ended question asking participants to describe their institution's approach to research data management and curation. One hundred one text responses were received. Based on some of the similarities between answers, the responses were classified by the level or stage at which the institution was in its approach to research data management and curation. Many respondents acknowledged that some efforts were being made to address services at their institutions. Twenty-eight respondents indicated that the institution had a plan in place to offer data services of some sort. Another 30 respondents claimed that data was handled on an ad hoc basis on their campus. Twenty-three respondents were in an education, research, or conversation phase, in which they were investigating potential roles, training librarians, and/or having conversations on campus about roles for the library and other campus partners. Thirteen respondents were working on policy development either within the library or across campus. Five indicated that they were working on an institutional repository to tackle data management and curation issues and a similar five were developing outreach tactics for the campus community to either publicize current services or gauge interest in potential services. Thirteen reported that no work was in process to address data management or curation on their campuses.

Many of the survey participants also mentioned campus partners or other units that were getting involved in data management or curation. Three respondents claimed that other campus units were taking on roles of data management and curation and 18 partnered with other campus units to provide services. Nine indicated that individual departments or researchers were dealing with data management and curation issues themselves and only one mentioned that these issues are handled solely by campus IT. Fifty-two stated that the library was handling these roles without indicating any other partners.

During the review of this data, we found it interesting that many survey respondents associated data management and curation with the existence of a repository. Twenty-five of the respondents mentioned repositories, with a few discussing data repositories specifically. This was interesting because institutional repository software is not always conducive to housing data and data services are not strictly limited to the curation of data in a repository.

### [H3]Professional Development

The remaining five questions of the survey were geared toward determining what kinds of professional development opportunities might be the most well-received for education on research data management and curation. Survey respondents were asked to select the topics they were most interested in learning more about. The most popular topics were documentation and organization best practices; curation software and tools; data information literacy; data sharing and reuse; and data policy and regulation. All topics that were of interest to respondents are detailed in the figure below:



[CPB]Figure 3: Interest in Research Data Management and Curation Topics

Other topics that survey respondents wrote in included digital preservation, digital archiving, funding data management and curation, community practices, email archiving, building buy-in from faculty and campus administration, data manipulation, etc.

Respondents were also asked what types of activities would be most useful for them based on their professional needs. Most (81%) indicated that reviewing best practices and practicing with tools and software would be the most helpful. Many (65%) were interested in reading/listening and discussing case studies while 30% were interested in learning about theory. Five percent wrote in responses including data-centric conferences such as RDAP, "listening to and engaging others," "ideas on how to move forward," "conducting research studies," and getting involved in best practice authoring.

[H4]Delivery Methods

We were also interested in determining what the best method of delivery would be for professional development such as webcasts, asynchronous online classes, one-day workshops such as a roadshow, multi-day data management institutes, ACRL conference sessions, or other methods. Participants were asked to rank these five options and were provided the opportunity also to rank and write in "other" options. Webcasts ranked the highest, with a mean of 2.12 (with one as most important and six as least important).

One-day workshops and asynchronous online classes were ranked at about the same level with workshops at a mean of 2.74 and online classes at 2.84. ACRL conference sessions were ranked at a mean of 3.60 and multi-day data management institutes at 3.83. Perhaps it can be inferred that lower time commitments with more flexibility are preferable for many of the survey participants since webcasts, one-day workshops, and online classes ranked highest. A few respondents indicated other opportunities they would be interested in including downloadable articles, resources on best practices for self-study, MLS curricula, educational opportunities for those not associated with the library, ACRL sessions at ALA Conferences, free online information, and collaborative projects with "learn-by-doing" participation.

[H4]ACRL

Participants were also asked what more they would like to see from ACRL in terms of professional development offerings on research data management and curation. Thirteen respondents mentioned the need for some sort of resource collection of best practices including curricula, training materials, case studies, and toolkits. One respondent referred to this as a "clearinghouse" for research data management and curation best practices. Ten were concerned about cost of opportunities and suggested more free resources. Nine were interested in more online opportunities. Six respondents mentioned more discussion of outreach and collaboration with their constituents. Five asked for higher level training opportunities for the more advanced practitioners, mentioning that more tiered opportunities would be helpful. Three were interested in seeing more training on subject specific metadata standards. Two wanted to see opportunities for non-research institutions and/or opportunities for undergraduates specifically.

[H4]Existing Opportunities

In the final question, we asked respondents what professional development opportunities they had already participated in, regarding the topics of research data management and curation. Many respondents (63%) had attended a webinar; sponsors of these webinars included the Digital Curation Interest Group, bepress, National Information Standards Organization (NISO), Society of American Archivists (SAA), the Association for Information Science & Technology (ASIS&T), Special Libraries Association (SLA), Association of College & Research Libraries (ACRL), American Library Association (ALA), Library Journal, the Association of Research Libraries (ARL)/Digital Library Federation (DLF) E-Science Institute, Preservation and Archiving Special Interest Group (PASIG), LYRASIS, ARL, and state and regional institutes. Less than half (41%) had attended a research data-focused conference such as the Research Data Access and Preservation (RDAP) Summit or the International Digital Curation Conference (IDCC). 33% had participated in an online class such as those available on Coursera and only 15% had attended an e-science bootcamp. 34% indicated that they attended other types of professional development events. Some of these included the Data Curation Profiles Toolkit Workshop; an ACRL data management online course; the Interuniversity Consortium for Political and Social Science Research (ICPSR) Data Curation Summer Institute; DataONE involvement; the e-Science Institute; various other

national, state and local workshops; on-campus events; self-study and review of literature; etc.

Responses from this survey were helpful in informing the development of an ACRL pre-conference, especially with establishing an approach that would reach the right audience. We were surprised by many of the survey responses; for instance, the interest in professional development opportunities on metadata standards for data management and curation was unexpected and something that was incorporated both in the pre-conference and used for a later DCIG webinar. Additionally, the expertise levels and levels of comfort with research data management and curation topics were lower than expected. Many professionals were clearly seeking better professional development opportunities to help with preparation and confidence so that they would be better able to implement services at their own institutions.

# [H1]ACRL 2015 Pre-conference

[TEXT IND]In some ways, the pre-conference was designed as a pilot program for what we would propose for future stand-alone professional development offerings. We had the DCIG survey responses to help focus the scope of the pre-conference. Respondents indicated that they were looking for more practical knowledge, so rather than focus on the theory of data management and curation, we took a practical strategies approach. Three learning outcomes were defined:
1. Define data management as it relates to data information literacy in order to build upon existing information literacy pedagogy
2. Develop a framework for determining the most appropriate scale for data management services based on institutional circumstances
3. Develop strategies for engaging faculty and students on data management issues in order to advance data information literacy

To further refine the content, we sent a survey to all registrants for the pre-conference to gauge experience level and collect demographic information (see Appendix 2). Approximately 60 participants attended the pre-conference. About half of the respondents indicated that they were subject librarians, while the rest were distributed across administrator and data services roles.

The session was seven hours long, including a 90-minute break for lunch and two 15-minute breaks. We chunked the information into "modules," units with a single theme that we delivered in a sequential manner and that all participants would move through together. While a focus on the practical was the main direction of the pre-conference, we felt that a strong foundation that related data to the research and scholarly life cycle was a critical starting point.

## [H2]*Module 1. Introduction: data and scholarly communication*

The first, 50-minute module was built to introduce data as another information type to be incorporated into library support for the research and scholarly life cycles. Data can be considered as both a contributor to, and product of, scholarship. Libraries exist as stewards of information and we have continued to diversify and evolve the ways with which we engage with that information. Weaving information literacy (IL) into our

role as stewards is not a stretch: understanding information and how to find and use it effectively is the reason for the stewardship - there is not much point to stewarding information if no one can find and use it. This relationship with information literacy is analogous to the role that scholarly communication plays with information literacy. The ACRL white paper on the intersections of scholarly communication and IL reinforces this perspective and even makes note of the importance of treating data as an aspect of IL (ACRL Working Group on Intersections of Scholarly Communication and Information Literacy, 2013). Ending the first module with a focus on information literacy instruction and scholarly communication allowed for a smooth transition to the second module, which focused effective data information literacy instruction strategies.

## [H2]*Module 2. Data management: developing an instruction strategy*

Providing introductory RDM best practices instruction is one of the most common areas of engagement for libraries who are starting out in building a data services program (ACRL Research Planning and Review Committee, 2012; Cox et al., 2012; Tenopir et al., 2012). It's an opportunity to provide a needed service that has a relatively low barrier for entry, and can be a mechanism for getting a tangible research data service (RDS) off the ground. We started this 70-minute module by reviewing the current range of data management instruction offerings being provided by academic libraries. It's important to recognize that RDM instruction can be designed and conducted in many ways that go beyond the 50-minute one-shot. The instruction should both meet the needs of the intended audience, and reflect the preferences of the librarian offering it.

### [H3]Module 2a. Introduction to data information literacy instruction

In this module of the workshop, we first reviewed a range of current DIL instruction offerings happening in academic libraries, and then provided suggestions regarding things to keep in mind while developing instruction within your institution. Instructional offerings that we reviewed included credit-bearing graduate-level courses (Borgman, 2015; Creamer, n.d.; Whitmire, 2014; Wright, n.d.), a non-credit flipped classroom, discipline-specific course (Johnston and Jeffryes, 2015), workshops series on RDM basics (Coates, 2013; Muilenburg et al., 2015), workshop series on applied topics (e.g., how to write a data management plan, how to create metadata, how to keep a lab notebook, etc.), and workshop one-shots (UK Digital Curation Centre, n.d.). After reviewing these examples, we had workshop participants engage in a five-minute pair-and-share exercise to discuss DIL instruction. It focused on whether or not there were examples of instruction that we didn't mention. Following the report-out from the activity, we then reviewed a suggested pedagogical approach to teaching DIL. The approach is explained in Whitmire (Whitmire, 2015). Briefly, the approach is based on the following observation: the tenets of RDM best practices are discipline agnostic, but the application of best practices is very discipline- and situation-specific. Given that, if you really want your pupils to absorb the information and use it, they need to see how the information translates to their workflow, or better yet - practice it during class activities. The approach to developing course content involves outcomes-centered course design,

with active-learning components to promote engagement and internalization of information (Whitmire, 2015).

### [H3]Module 2b. Instruction activity

In order to engage workshop participants with the topic of DIL instruction, we conducted an activity where they could work on designing their own hypothetical piece of instruction. In this case, they were asked to design a 50-minute instruction session on metadata. We encouraged them to consider the following aspects in designing their workshop:
1. Audience - who is the workshop for?
2. Staffing - who will do the teaching? Do they need professional development?
3. Learning outcomes - what do you want attendees to learn?
4. Content - what major topics will you cover?
5. Active learning - How will you get students engaged with the material?

The purpose of this activity was to give librarians a chance to: 1) think about the large variety of different educational opportunities there are regarding data management; and 2) to strategize lesson plans for potentially challenging environments where they may have a multitude of different user needs in one session. This exercise was intended to introduce librarians to the most important considerations of designing DIL instruction, and give them a feel for the process and effectiveness of active learning.

## [H2]*Module 3. Engagement with the campus community*

### [H3]Module 3a. Reflective writing and discussion

At the beginning of the 80-minute third module, participants were instructed to reflect upon their environments and note instructional efforts that might address certain challenges, using large-easel pad paper to write down their responses as a group. A PowerPoint slide provided a few examples, including lack of, or untrained, personnel; campus infrastructure; library stakeholders; and administrative stakeholders. Eight groups were formed. They discussed and recorded challenges for five minutes and were given ten minutes to report back as a group. Some challenges reported by one group included IT dismissal of unfunded efforts; lack of understanding of storage vs. preservation; how to market services; the challenge with finding champions; convincing researchers of the value; and issues with timing being either preventative or rescue. Another group used the examples from the PowerPoint slide as a starting point and addressed those topics. For instance, they found that lack of trained personnel was a problem because many might be hesitant to learn new tasks and their current skills were ill-defined. The same group expressed challenges with library stakeholders in committing to new duties and identifying what duties they might need to discontinue. A third group discussed issues with staff training, lack of staffing, and fear of failure, but identified small scale solutions such as brown-bag lunches, online training, and partnerships with other university departments to kick start initiatives. The remaining groups reported similar challenges to the three mentioned above. After the groups compiled a list of challenges together, a moderator led the discussion where these challenges were shared.

### [H3]Module 3b. Panel discussion with framing questions

After participants completed the reflective writing and discussion portion of the module, they had a chance to hear, via a moderated panel discussion, how colleagues in the field have addressed similar or other challenges in research data management services. The panel consisted of three librarians from a variety of environments: a small liberal arts college, a large research university, and a university that serves as the academic health center of its state. The following questions framed their discussion and remarks:

- Whom have you partnered with at your campuses? How did you decide on whom to work with?
- How have you framed this topic as you've done outreach at your various institutions with a range of stakeholders?
- What are the top three to five points to convey to various audiences when making a case for institution-wide data management services?
- What have you learned from these collaborations and relationships? How has this knowledge informed service models and program development at your institution?

In their responses panelists recounted partnerships with faculty and other librarians that enabled new approaches to teaching about data management, including use of actual research data sets, and encouraged more collaboration and relationship building with campus entities, such as the Office of the Vice-President for Research and the Office of Sponsored Programs.

### [H3]Module 3c. Role play activity

As a final activity for the third module, participants were encouraged to pair up for a role play activity. Each pair received two cards; each card had a role defined. We felt it was important to acknowledge that conversations about data services are not limited to subject liaisons and faculty members; often librarians and library administration must correspond with administrators on campus to promote or establish services. Roles that participants could play included a librarian and faculty member; a librarian and college administrator or dean; and a library administrator and an administrator from an Office of Research or Sponsored Programs. The faculty member role also had three separate versions to reflect the challenges for discussing data needs across disciplines. Faculty member roles included social science researchers, an engineering professor, and a biologist. All cards included questions and prompts for both the library and the campus representative. Participants were given ten minutes to role play and then ten minutes to report back to the group about their experiences.

## [H2]*Module 4. Data: taking it home*

This 60-minute module was designed to give attendees the opportunity to develop a tangible plan for how they could apply what they learned at the workshop back at their home institution. We provided an "Action Plan" worksheet (see Appendix 3) with three sections. In the first section, attendees were prompted to list internal and external

stakeholders, and potential partners for research data services at their campus. Next, we asked them to list "drivers," things that would help achieve their vision for RDS, and "barriers," or things that might keep them from achieving their vision. A third table asked them to consider the following: one thing they could do immediately after returning home, one thing that would take some time, and one thing that they had no idea how to start. Finally, there was a blank area labeled "Action Plan" where they could bring all of the previous information to bear in drafting or brainstorming a plan of action for developing or expanding RDS. Participants that were comfortable sharing their drivers and barriers could do so, but this exercise was mainly focused on giving them a structured plan to refer back to when they returned from the conference.

## [H2]*Module 5. Looking to the future*

The pre-conference concluded with some thoughts regarding the ongoing training and education needs, with respect to RDM. Many librarians may find that data has become a new medium that they need to build fluency with, but they lack the time or ability to seek out continuous education for it. Moreover, in the event that they are able to attend workshops or training sessions, the pipeline from administration that would allow for application of these new skills is often absent. How can we build that pipeline that asks, "How will your library benefit by having this person participate?" "How will this person apply these learned skills?" This last, 45-minute module focused the discussion on these issues, prompting nearly all the attendees to realize that they had not had any kind of conversation on these matters within their organization. Discussion around sustainability also came up, with the concept of "team librarianship" garnering some attention. In this model, not every librarian is expected to be an expert across domains, but there is an expectation of foundational knowledge and the practice of referral to the content expert. This can alleviate the pressure to master the many emerging areas of support by an academic library, such as RDM, copyright, digital humanities, and so on.

The end of this module promoted a follow-up webinar in an attempt continue the conversation and assess how much of the activity worksheet was able to be carried back to the institution. Lastly, a post-assessment survey (see Appendix 4) was distributed on paper to all attendees, to compare to the pre-assessment survey data.

# [H1]Pre & post assessment of ACRL 2015 pre-conference

[TEXT IND]In order to best determine how to propose a professional development program that would be most effective, it was critical that the pre-conference undergo some form of assessment. While the pre-conference was not intended to be identical to an association-wide program, there were portions of it that could serve as a foundation for a program. Moreover, we wanted to assess the areas of need from the audience and how they viewed the purpose/engagement of the association in this area.

Three "comfort-level" Likert scale questions were included on both the pre- and post-surveys for the March pre-conference. These questions were intended to evaluate, in a generalized manner, the comfort of participants with RDM activities before and after the pre-conference. These questions were:

1.  "How prepared do you feel you are to teach research data management (in a classroom setting) at your institution?"
2.  "How prepared do you feel you are to offer research data management support (consultation) to researchers at your institution?"
3.  "How prepared do you feel you are to engage external stakeholders (e.g. faculty, campus IT, university administrators) in conversations about research data management at your institution?"
    The scale was a five-point range from "1: very unprepared" to "5: very prepared."

In short, there was an increase in perceived comfort-level across all three questions, with preparedness to offer RDM consultations exhibiting the least gain. Some caveats to this data analysis must be stated. The data are not from matched pairs. That is, we do not know that the same person who took the pre-survey took the post-survey and what the difference in that individual's responses were. We had 31 pre-survey responses and 38 post-survey responses to these questions, so while we know that the populations overlap, we cannot link the data back to individuals. Despite the fact that we cannot state that "Person A" demonstrated comfort-level gains, these aggregated responses do allow us to look at the trend across the cohort.

**[CPB]Table 1.** Results from the pre- and post-surveys regarding ACRL 2015 'Brass Tacks' pre-conference participants' views on their ability to provide RDM services. Numbers shown are means. N=31 for the pre-survey; N=38 for the post-survey.

|  | Pre-survey | Post-survey | Change |
| --- | --- | --- | --- |
| How prepared do you feel you are to teach research data management (in a classroom setting) at your institution? | 2.03 | 3.47 | +1.44 |
| How prepared do you feel you are to offer research data management support (consultation) to researchers at your institution? | 2.29 | 3.26 | +0.97 |
| How prepared do you feel you are to engage external stakeholders (e.g. Faculty, campus it, university administrators) in conversations about research data management at your institution? | 2.36 | 3.76 | +1.38 |

We also provided opportunities for open ended response to several questions on the post-survey to assess what skills participants got from the pre-conference, what they felt was missing from the content, if they liked the delivery format of the session, and what role they thought ACRL should play in providing continuing education in this area. Of the 38 responses to the question of what role ACRL should play, not a single response indicated that ACRL should not engage in this area (an unsurprising finding, considering the venue). Fifteen of those responses indicated that ACRL had a "strategic," "important," "major," "imperative," or "clear" role in providing professional development for RDM, especially to subject liaison librarians. Other responses suggested types of engagement, such as workshops, education materials, training sessions, "more

than webinars," and online courses. Several mentioned that RDM was important to incorporate into information literacy and be marketed as a subject liaison responsibility.

As a last effort to assess the success of the pre-conference, we also organized a follow-up webinar for attendees to share what they had taken back to their institutions, what thoughts they had about the topics discussed at the pre-conference, what they might have been able to implement, and what they felt might have been missing from the pre-conference. We also shared results from post assessment surveys with the group. This webinar occurred a little under two months after the pre-conference. Four of the pre-conference participants attended, which was less than 10% of the pre-conference attendees.

# [H1]Discussion

Our survey results indicated that many were interested in one-time, short events such as webcasts, so it may seem counterintuitive that the resulting event was a full one-day pre-conference at an ACRL conference. However, introducing approaches to research data management are not easy to do in short webcasts unless they are part of a series; in this regard, a one-day event was more conducive to providing a robust professional development experience. Additionally, the survey participants' interest in shorter events can be correlated to many of the challenges that these participants face in their institutions, which emerged during the pre-conference discussions. Many are understaffed, underfunded, and do not have dedicated resources for RDM. It is our hope that additional professional development opportunities may help establish the importance of RDM in academic libraries among library and campus administrators, which may result in increased support for those activities at the home institution.

We learned that conducting a follow-up webinar to a professional development offering was unlikely to be successful. In an attempt to build community and continue the conversation, we conducted a webinar one month after the pre-conference. We had very few attendees and it was challenging to implement due to technological issues. In retrospect, there might have been a better mechanism to promote discussion between pre-conference participants than a one-time webinar that many were unable to attend, such as an asynchronous discussion. It would be interesting to investigate what the impact of the community groups and MeetUp sessions facilitated by the ANDS 23 (research data) Things (Australian National Data Service, n.d.) has been and if these efforts have resulted in positive outcomes.

Given the DCIG survey data, the pre-conference assessment survey data, and the expertise of the authors, we presented a series of recommendations to the ACRL Board in June 2015. We provided three professional development models: a RDM roadshow, in the same vein as the ACRL Scholarly Communication Roadshow; moving DCIG from an interest group to a section, which within the organizational structure of ACRL would allow for more structure, consistency, and committee support for outreach and engagement; and lastly, an additional module or track focusing on data information literacy to the ACRL Immersion Program (Association of College and Research Libraries, n.d.) After some discussion, the ACRL Board approved the establishment of a RDM roadshow and encouraged DCIG leadership to begin the process of petitioning a move to section. The RDM roadshow planning process transitioned from the authors to

the ACRL Research and Scholarly Environments Committee, which has oversight of the Scholarly Communication Roadshow.

# [H1]Conclusion

The work presented in this article only begins to touch on progress towards creating sustainable and targeted RDM professional development opportunities for liaison librarians; future initiatives that this work has influenced or encouraged are still in development. The results of the survey provide some detail about comfort levels of ACRL DCIG members faced with responsibilities to offer RDM services in their institutions as well as preferences for delivery of professional development on the topic. The results of the survey informed much of the ACRL pre-conference discussed in this article and these results may continue to offer insight into what kinds of RDM opportunities subject liaisons need so that they can address shifting job expectations.

The pre-conference served as a test ground for future ACRL professional development opportunities on RDM. Multiple modules were presented with topics such as data and scholarly communication, data management instruction strategies, engaging the campus community, creating individual action plans, and discussing future roles for subject liaisons in regards to RDM services. When comparing the pre- and post-assessment of the pre-conference, participants indicated that their levels of preparation increased because of the contents of the pre-conference; participants felt more prepared to teach research data management, to engage external stakeholders on campus, and to offer research data management support. The establishment of a RDM roadshow, and its oversight from the Research and Scholarly Environments Committee of ACRL, indicate that the establishment of professional development opportunities in RDM for academic librarians is important and should be ongoing.

# [H1]Appendices

## [H2]*Appendix 1: DCIG survey*

In an attempt to better inform the organization of membership needs around research data management and curation, the Digital Curation Interest Group is soliciting your feedback. This survey is completely voluntary and results will be kept confidential and anonymous. While digital curation encompasses a wider scope than just research data, this survey is focusing on just that facet. The survey should take no more than 10 minutes and will help ACRL better serve you.

In this survey, "research data management" refers to the activities necessary for documenting, maintaining, and making accessible the data collected in the course of research. The data are discipline agnostic and may be in any format. "Research data curation" refers to the ongoing stewardship of research data over its useful lifecycle. One way to frame this relationship is that one can manage research data without necessarily providing ongoing curation.

1) What is the size of the institution at which you are currently working? (In this survey, FTE refers to full-time equivalent enrollment)
- Very small/small (1-2,999 FTE)
- Small/medium (3,000-4,999 FTE)
- Medium (5,000-9,999 FTE)
- Medium/Large (10,000-19,999 FTE)
- Large (20,000+ FTE)

2) What is the type of institution at which you are currently working?
- Community college
- Baccalaureate college
- Master's college or university
- Doctorate-granting university
- Research institution (non-educational)
- Government institution (federal or state)
- Other _____

3) What is your current (or anticipated) role at your institution?
- Administrator
- Liaison/Subject Librarian
- Archivist/Special Collections Librarian
- Data Specialist/Data Services Librarian
- Scholarly Communication/Digital Repository Coordinator
- Other _____

4) Which of the following user groups do you serve? (Check all that apply)
- Faculty
- Staff
- Undergraduate students
- Graduate students
- Post-Docs
- Public
- Librarians
- Independent researchers
- Other: _____

5) How would you rate your current expertise with research data management?
- Completely new to the field
- Limited experience in the field
- Intermediate expert in the field
- Expert in the field

6) How would you rate your current expertise with research data curation?
- Completely new to the field
- Limited experience in the field
- Intermediate expert in the field

- Expert in the field

7) How prepared do you feel you are to engage in research data management activities at your institution?
- Very unprepared
- Somewhat unprepared
- Neither prepared nor unprepared
- Somewhat prepared
- Very prepared

8) Please describe your institution's approach to research data management and curation.


9) What research data management and curation topics are you most interested in learning more about? (Check all that apply)
- Metadata standards
- Curation software and tools
- Communicating with constituents
- Data management consulting
- Data information literacy
- Database creation
- Appraisal and selection of data
- Data sharing and reuse
- Data policy and regulation
- Documentation and organization best practices
- Storage and security best practices
- Other _____

10) Based on your professional needs, what types of activities would be most useful to you? (Check all that apply)
- Reviewing best practices
- Learning about theory
- Reading/listening and discussing case studies
- Practicing with tools and software
- Other_____

11) Which of the following continuing education opportunities would you be most interested in ACRL offering? (Rank in order of importance)
- Webcasts
- Asynchronous online class
- One-day workshop (regional/"roadshow")
- Multi-day data management institute
- ACRL Conference sessions
- Other _____

12) What would you like to see ACRL doing more of in terms of professional development offerings in the area of research data management and curation?

13) Please list what other professional development opportunities you have engaged with on the topic of research data management and curation. (Check all that apply)
- Attended a research data-focused conference, e.g. RDA Summit, RDAP, DCC\
- Participated in an e-science bootcamp
- Participated in an online class, e.g. Coursera
- Attended a webinar
  - If so, who sponsored it? _____
- Other _____

## *Appendix 2: Pre-conference pre-assessment*

1) What is the size of the institution at which you are currently working? (In this survey, FTE refers to full-time equivalent enrollment)
- Very small/small (1-2,999 FTE)
- Medium (3,000-9,999 FTE)
- Medium/Large (10,000-19,999 FTE)
- Large (20,000+ FTE)

2) What type of institution do you work at?
- Community College
- Baccalaureate College
- Master's College or University
- Doctorate-granting University
- Research Institution (non-educational)
- Government Institution (federal or state)
- Other _____

3) What is your current (or anticipated) role at your institution?
- Administrator
- Liaison/Subject Librarian
- Archivist/Special Collections Librarian
- Data Specialist/Data Services Librarian
- Scholarly Communication/Digital Repository Coordinator
- Other _____

4) How would you rate your current expertise with research data management?
- Completely new to the field
- Limited experience in the field
- Intermediate expert in the field
- Expert in the field

5) How prepared do you feel you are to teach research data management (in a classroom setting) at your institution?
- Very unprepared
- Somewhat unprepared
- Neither prepared nor unprepared
- Somewhat prepared
- Very prepared

6) How prepared do you feel you are to offer research data management support (consultation) to researchers at your institution?
- Very unprepared
- Somewhat unprepared
- Neither prepared nor unprepared
- Somewhat prepared
- Very prepared

7) How prepared do you feel you are to engage external stakeholders (e.g. faculty, campus IT, university administrators) in conversations about research data management at your institution?
- Very unprepared
- Somewhat unprepared
- Neither prepared nor unprepared
- Somewhat prepared
- Very prepared

8) In your opinion, how prepared is your library/unit to offer research data management support?
- Very unprepared
- Somewhat unprepared
- Neither prepared nor unprepared
- Somewhat prepared
- Very prepared

9) What skills or information do you hope to get out of this pre-conference?

10) Have you taken advantage of other professional development opportunities regarding research data management?

-YES
-NO

## [H2]*Appendix 3: Action Plan Worksheet*

Action Plan Worksheet – *fill out each column for your own local environment*

| Internal Stakeholders | External Stakeholders | Potential Partners |
|---|---|---|
|  |  |  |

| | | |
|---|---|---|
| | | |
| | | |
| | | |

| Drivers (helps to achieve your vision) | Barriers (keeps you from achieving vision) |
|---|---|
| | |
| | |
| | |
| | |

| One thing I can do when I get back | One thing that will take some time | One thing that I have no idea how to start |
|---|---|---|
| | | |

Action Plan:

## [H2]*Appendix 4: Pre-conference post-assessment*

1) How prepared do you feel you are to teach research data management (in a classroom setting) at your institution?
- Very unprepared
- Somewhat unprepared
- Neither prepared nor unprepared
- Somewhat prepared
- Very prepared

2) How prepared do you feel you are to offer research data management support (consultation) to researchers at your institution?
- Very unprepared
- Somewhat unprepared
- Neither prepared nor unprepared
- Somewhat prepared
- Very prepared

3) How prepared do you feel you are to engage external stakeholders (e.g. faculty, campus IT, university administrators) in conversations about research data management at your institution?

     Very unprepared
     Somewhat unprepared
     Neither prepared nor unprepared
     Somewhat prepared
     Very prepared

4) What skills or information did you get out of this pre-conference?

5) What information was MISSING that you would have liked us to cover?

6) Did you feel that this workshop structure was an effective way to learn about this topic? Why or why not?

7) What role should ACRL play in providing continuing education programming for research data management?

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