Support for Research Data Management among U.S. Academic Institutions:

Results from a National Survey

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1. Introduction

The evolving landscape of scholarly production presents academic libraries with new opportunities and challenges for curating, managing, and preserving the inputs and outputs of research and scholarship. To better gauge librarians' expectations and perceptions of research data management the Texas Center for Digital Knowledge and the University Libraries at the University of North Texas conducted a survey of librarians from 200 U.S. research institutions in Fall 2010. The survey, *Support for Research Data Management among U.S. Academic Institutions*, intended to survey current librarian efforts and attitudes towards management of research data and the role of librarians in supporting scholarship as research data increasingly becomes digital. This report presents the results of the survey.

2. Overview of the Survey and Respondents

The survey questionnaire contained eight closed-ended questions, with a number of the questions providing for comments by the respondents. The survey was divided into three sections; 1) Librarians' Priorities in Managing Research Data; 2) Librarians' Role in Managing Research Data; and 3) Building Competencies in Research Data Management. None of the items were mandatory. See Attachment A for a copy of the survey instrument.

The 200 institutions receiving the survey were selected were based on the amount of NSF funding each received in the previous three years. Requests for participation were delivered to Library Deans and Directors via email. The Deans and Directors were asked to distribute the request to complete the survey with other library staff they deemed appropriate to complete the survey. The survey was administered online using Lime Survey.

A total of 68 usable and complete responses were received for a response rate of 34%. No personally identifying information was requested; all respondents were anonymous. No information regarding the institution was collected. However, using the IP addresses of the responses, we are able to get a sense of the geographic distribution of the respondents. The following shows the geographic distribution of the responses.

3. Survey Results

This section presents the results for each of the survey questions. Included for each question are:

- Frequency count of respondents' answers
- Percentage for each answer
- Respondent comments for questions including a text response option.

3.1. Question 1

Do you believe librarians should play a role in managing researchers' digital data?

Answer	Count	Percentage
Yes	68	100.0%
No	0	0.0%
Total	**68**	**100%**

3.2. Question 2

Using the following scale, indicate the degree to which you believe librarians should be involved in managing research data.

- 1 = not at all (researchers are solely responsible for research data management)
- 2 = somewhat (researchers play a greater role, but librarians assist with research data management)
- 3 = equally (librarians and researchers share responsibility for research data management)
- 4 = mostly (librarians play a greater role, but researchers assist with research data management)
- 5 = completely (librarians are solely responsible for research data management)

Answer	Count	Percentage
1 – Not at all	0	0.0%
2 – Somewhat	26	38.2%
3 – Equally	27	39.7%
4 – Mostly	14	20.6%
5 – Completely	1	1.5%
Total	**68**	**100%**

3.3 Question 3

Does your library anticipate investing in new library positions and/or infrastructure within the next 5 years to support research data management?

Answer	Count	Percentage
Yes (1)	35	51.5%
No (2)	7	10.3%
Don't know (3)	26	38.2%
Total	**68**	**100%**

3.4. Question 4

What kind of role should libraries and librarians play in managing the data produced by researchers? Indicate how necessary each of these roles is likely to be at your institution by checking the button for critical, very useful, useful, somewhat useful, or negligible across from each example. Use the text box provided to note other roles not already listed, or to comment on your selections.

3.4.1. Informational: directing scholars to resources that will help them manage their own research data

Answer	Count	Percentage
Negligible	0	0.00%
Somewhat Useful	0	0.00%
Useful	16	24.6%
Very Useful	21	32.3%
Critical	28	43.1%
Total	**65**	**100%**

3.4.2. Instructional: providing training in the tools and information necessary for curating research data

Answer	Count	Percentage
Negligible	0	0.00%
Somewhat Useful	3	4.6%
Useful	9	13.8%
Very Useful	35	53.9%
Critical	18	27.7%
Total	**65**	**100%**

3.4.3. Infrastructural: providing space and resources for storing and accessing research data

Answer	Count	Percentage
Negligible	1	1.5%
Somewhat Useful	7	10.8%
Useful	17	26.2%
Very Useful	19	29.2%
Critical	21	32.3%
Total	**65**	**100%**

3.4.3. Cooperative: making tools and other resources available for scholars' use in managing research data

Answer	Count	Percentage
Negligible	2	3.1%
Somewhat Useful	3	4.6%
Useful	15	23.1%
Very Useful	30	46.1%
Critical	15	23.1%
Total	**65**	**100%**

3.4.4. Collaborative: actively participating in and guiding scholars' research data management

Answer	Count	Percentage
Negligible	3	4.6%
Somewhat Useful	6	9.2%
Useful	11	16.9%
Very Useful	27	41.6%
Critical	18	27.7%
Total	**65**	**100%**

3.4.5. Archival: preserving and providing access to research data, once a scholar or research project no longer resides at the university

Answer	Count	Percentage
Negligible	0	0.0%
Somewhat Useful	3	4.5%
Useful	10	15.2%
Very Useful	15	22.7%
Critical	38	57.6%
Total	**66**	**100%**

Respondents' Comments on Question 4 (N=18)

Ideally we would like to be able to list all of the categories above as "critical", but we must be realistic about our time and budgetary constraints. Ultimately, at our institution the library will probably take a mostly instructional role, with guidance on archival issues as we grapple with electronic records issues.

Indexing/Cataloging - Making research data easily locatable by other researchers in standardized shared databases. Making data search-able without having to do full data downloads.

The above selections reflect the instruction phrase about what the roles "are likely to be at your institution." The selections do not reflect my thoughts of what should be. Several library administrators approached science department chairs about the role of the Library in data curation and were told in no uncertain terms that the scientists know how to handle their data and do not need help from librarians. Perhaps our social scientists will be more amenable to the possibility of help from the Library.

Collaborative in another sense - that is doing this work at the consortial level rather than at the local level.

For actual storage we are envisioning a partnership with central university IT

Must be conceived in a multi-institutional context

Advocacy for things like open access and shared data such as in repositories. Education about copyright/ownership of data.

Provide and advocate for transparency, teach intellectual property issues, open access, etc. All these things overlap in some ways and are very different in others. It is important to have as clear an understanding of this as possible. Librarians should be leaders in this area.

Collaborative with academic computing organization

While probably all of these are critical in terms of their usefulness to researchers, librarians would not be able to provide these services without substantive institutional support, so I have answered framed by the reality that most institutions will not provide substantive support of these services.

Infrastructure (storage and servers) should not be the responsibility of the Libraries, but it should be the work of the Information Technology on campus, with guidance from Libraries on format and requirements.

It is very important that research data be OPENLY ACCESSIBLE!

About archival, there may be roles to assist researchers in finding the appropriate repository to store their data. This may be library-run (such as an institutional repository) or a discipline specific subject repository (such as Genbank).

For #3, yes to access, but not sure about storage.

Cooperative, in the sense of librarians partnering with IT personnel to create and maintain research data is critical to a data management program's success. If, however, cooperative means developing and turning over the process to researchers for them to manage, as one question seems to imply, I find such a role of negligible value, as the researchers will not be willing to invest the time needed to manage these data sets.

Playing a truly collaborative role necessarily incorporates those roles marked as only useful.

Re: Archival statement Researcher no longer being part of university makes a big difference. If s/he is still connected, the importance of the library's archival role increases.

While a full collaborative approach might be desirable - such as librarians assigning metadata and performing some degree of QA - it's probably not scalable.

3.5. Question 5

What specific roles should the library play in order to make research data widely available and accessible? Indicate how necessary each of these roles is likely to be at your institution by checking the button for critical, very useful, useful, somewhat useful, or negligible across from each example. You may suggest other possible roles for the library in the text box provided.

3.5.1. Develop a technical infrastructure for preserving and providing access to data produced by researchers at the university

Answer	Count	Percentage
Negligible	2	3.1%
Somewhat Useful	4	6.3%
Useful	17	26.5%
Very Useful	19	29.7%
Critical	22	34.4%
Total	**64**	**100%**

3.5.2. Create dedicated data management and development positions or departments to advise researchers in storing, managing, and ultimately providing access to their research data

Answer	Count	Percentage
Negligible	2	3.1%
Somewhat Useful	4	6.3%
Useful	16	25.0%
Very Useful	24	37.5%
Critical	18	28.1%
Total	**64**	**100%**

3.5.3. Support training and certification programs in research data curation, for researchers and students across disciplines

Answer	Count	Percentage
Negligible	3	4.7%
Somewhat Useful	9	14.1%
Useful	18	28.1%
Very Useful	20	31.2%
Critical	14	21.9%
Total	**64**	**100%**

Respondents' Comments on Question 5 (N=13)

Supply disciplinary expertise to IT experts and data librarians in data-related consultations.
Licensing vendors who specialize in archiving, indexing, and preserving data.
Librarians can develop a template or an ingest survey to guide the deposit of research data and also to help that could be used for funder-required data planning.
Must be conceived in a multi-institutional context
Work on a national level with computer scientists, engineers, ethicists, etc. to create standards, and cross disciplinary understanding. In this way librarians' central skills-in supporting democracy and providing a theatrical as well as providing a sustainable framework for data management-can inform the future trends of the research process.
Curation, including robust metadata, is critical for the discoverability of the data.
I believe all three of the components of question 5 are truly critical to the task of data management, however our institution is not able to provide these services to a "critical" capacity during these woeful budgetary times.
It is important for the Library to ADVOCATE and support policies that make it MANDATORY for researchers to contribute and collaborate in data curation.
This advisor role might be taken on by all librarians, per their role as a subject liaison, rather than the job of a specific department or position.
Provide information about discipline specific data repositories or other resources available that are not campus-based. Re: Statement 2 Who the positions and/or depts are dedicated to makes a difference. We believe they still need to be dedicated to the Library, and we interpreted this statement based upon the tasks rather than how/who the individual reports. Re: Statement 3 Support training and certification programs for librarians, too.

It will be critical that librarians carve out a role for providing infrastructure, information, and instruction. Having dedicated units and staff may ultimately be helpful and libraries may evolve to that. Initially, select library staff will likely take on these new roles regardless of their position or department in the library.

Facilitating the process of engaging with non-local service providers, e.g., not all libraries will/should manage all data created on their campus.

3.6. Question 6

Should library science programs and academic libraries work together to provide certification opportunities in research data management, for researchers and students across disciplines as well as library professionals and librarians in-training? Please explain your answer in the text box provided.

Answer	Count	Percentage
Yes	59	92.2%
No	5	7.8%
Total	**64**	**100%**

Respondents' Comments on Question 6 (N=42)

This is going to be an absolutely critical function as more and more data is born-digital and required to be managed under various grant plans. Libraries should be heavily involved in the process to manage and archive data, but staffing realities mean that ultimately researchers will be responsible for appropriately preparing and managing their own data.

Yes, researchers do need help knowing the options when preserving data, but certification should be optional, not required.

I think practicum experiences at research institutions are going to be essential to the success of a certification program.

We need more of these....

Here at UNC Chapel Hill the School of Information and Library Science has already begun development of curricula for data curation.

Not that I have witnessed any significant cooperative efforts between library schools and academic libraries to date, so am rather cynical whether it would happen now.

While I'm not always convinced that library or library school/association certifications are taken seriously outside of libraries, some recognition of training and expertise should be created.

This would provide some degree of standardization in concept and implementation

really my answer is I don't know but that's not an option; my work experiences have not involved any sort of collaboration with library science programs

This is a key need for the profession and our responsibility to the future. Despite data losses, the need for data curation is still largely unrecognized by many researchers.

The more we all know across disciplines the better. It would be great to be able to complete an online certificate.

Data management is already a necessary skill for librarians to have and this will only become more the case going forward. Certification would provide researchers with confidence in the service they would be getting from these librarians.

There may be some value to this, but I'm not totally convinced yet.

Library Science programs are already lacking in enough other areas...adding this onto the curriculum won't help. Library Science students often graduate with barely the fundamentals (e.g., using a

catalog is still challenging) therefore, I think data management is best learned on the job or as additional professional development.

Library/I Schools need to be training librarians for data management, by stressing principles of library science and the role of cataloging/metadata.

SLIS Certification will provide authenticity and help support research integrity.

This will require resources, and a motivation to do so, but the expertise exists in many institutions.

Currently most LS School are doing a dismal job in training student in "real world" issues confronting libraries and even more so on Data Management issues. They need to get with it or the MLS will be irrelevant. We will hire non MLS people to get the job done. Offering certification is a step in the right direction. Who would do the certification?

More of the new professionals in academic research libraries are entering the profession with research backgrounds. They can help bridge communication between researchers and traditional librarians.

I think this should just be another aspect of archival training for librarians and archivists

Yes, particularly to give the individual a view of the situation across multiple disciplines. Faculty may have tremendous expertise and experience in their areas, but may not have the time or inclination to develop a broader perspective.

Schools like SI Michigan or UCB are already at the forefront.

These are not necessarily certificate programs, but could be workshops, online tutorials, web sites.

I believe there will be opportunities in the future and the LIS programs have a responsibility to prepare students for them.

A growth industry!

Library and information science programs will be critically important in creating the workforce needed by academic libraries and the partnership will be important so both parties can understand the learning and develop performance expectations based on shared knowledge.

I'm actually ambivalent about certification programs, because I think teaching the skills is more important than certifying researchers. That said, training/certification/degree programs for librarians and information professionals are essential to the success of library initiatives in data sharing and archiving.

There are so many different types of datasets in a variety of fields, I am not sure you can have a general certification that will cover the field.

The model that has already been developed by UNC-CH DigCCurr Institute is an excellent one http://ils.unc.edu/digccurr/institute.html that we can adapt.

I hesitate to answer "yes" above as I really wish I had an "undecided" option. While I firmly believe that librarians/information professionals have valuable skills and perspectives to bring to research data management initiatives, I don't believe a wholesale training or certification program will be warranted (at least in the near future), as I think there will be wide variance from one institution to the next on how large a role - if any - librarians/libraries play in data management. Much will depend on whether or not an institution's research administrators will welcome librarians to the table when crafting data management strategies. There will also be resistance among researchers to let anyone from outside the field assist with data management, even if the research administrators have requested external partnership. With regard to LIS programs providing training for non-librarian researchers and students, I believe that would be a waste of effort and money. Such training or certification will likely need to be offered by funding agencies or associations in order to have legitimacy among researchers, although such training programs might also raise concerns about whether or not it is appropriate for organizations with vested interests to offer such training.

Doesn't seem specialized enough to merit a separate certification.

Academic libraries are at the forefront of practice, while LIS programs often operate at some remove from the front lines. LIS faculty are often unfamiliar with the workings of academic libraries, so such partnerships are essential if LIS programs hope to stay relevant.

Librarians are not matched 1 to 1 with researchers--each having a specialized expertise. For true collaboration and greatest understanding of the issues involved, both researchers & librarians need training.

Data management is a fairly new area for librarians, and most current librarians do not have the appropriate skills. It would be useful for schools to have a sense from academic libraries about what is needed on campus, and for academic libraries to know what students are learning. We need to develop new librarians with the skills needed in this data-intensive environment so that when we have open positions for data librarians there are folks with the skills and initiative to fill them.

Library science programs are the next generation of practitioners, so the programs should be providing a theoretical as well as practical underpinning for this type of digital preservation.

Absolutely. The roles of librarians are changing and data management is a niche for librarians to move into. It's essential for academic libraries and library science programs to be on the same page about this.

We should work more closely together on many certification and/or professional development/continuing education programs for library professionals.

I think it's more important for there to be in-training for librarians than to try to reach researchers and students in other disciplines.

I believe the necessary skills for data management, while parallel in scope and purpose to traditional librarianship, are significantly different and require additional or different training. I think there is a great need for programs to address this. However, I am also concerned about large-scale certification programs coming into existence before the need for the skills is fully realized.

Interesting idea, and may evolve to this if libraries succeed in developing the lead role on campus for research data management.

While I believe in certification, I also think such certification shouldn't be conferred without hands-on, practical work in research data management.

In my experiences, existing LIS programs focusing on data curation are a bit disconnected from reality. There is a great deal of emphasis on technology, metadata, etc. But more critical: problem solving, adaptability, interviewing/analysis skills, ability to work in teams. Also I think that these programs have under-estimated the degree to which existing librarians will become involved in these efforts and they need a great deal of help too. Many research libraries are not going to have the ability to hire lots of new staff to support these efforts.

3.7. Question 7

Do you believe training programs in research data management can be implemented at academic libraries without library science programs? Please explain your answer in the text box provided.

Answer	Count	Percentage
Yes	51	83.6%
No	10	16.4%
Total	**61**	**100%**

Respondents' Comments on Question 7 (N=49)

Again, this is a necessity-- although it is nice to have a program specifically devoted to information management, data management plans will affect researchers in all fields. As such, it will be librarians' responsibilities as information professionals to facilitate management and storage of that information for all researchers, regardless of the presence or absence of a dedicated library science program. At this institution, records management is working with the graduate school, IT, and researchers to make sure that data is appropriately managed under these new guidelines.

I doubt libraries have the personnel or the mandate to do this.
Eventually we are going to need local certification programs for our graduate students.
I think it could be done, but would be better if combined with education in the theory of best practices. Certification would also be more meaningful if done under the aegis of an accredited library school.
My answer would be maybe - depending on institutional context and the collaboration options available on a particular campus.
Many research libraries have positions that can support these types of functions a library science program would be logical- but is not absolutely essential...
I don't mean to sound glib, but librarians can develop and sustain any national or local training programs they set their minds to.
I believe data management will need to be very tailored to the needs of the researchers. The skills and expertise needed will be difficult to provide anyone in advance of the grant proposals. Therefore, I think there will be a lot of on-the-job training that will be required.
Having a library science program is preferable but it's not feasible to have all academic libraries have access to them. It needs to be a broad based approach, maybe with "centers of excellence" where the library schools are.
The critical piece is the design of the curriculum and the resources to deliver in multiple instructional formats.
again the real answer is I don't know
The number of library schools has diminished but the need for data management has increased. Much training in librarianship goes on outside of library science programs, though usually not formally. Data management is a crucial need we need to address by whatever means possible.
This is an unclear question. I thought you meant without a Library Science program on campus. But I realize you mean with a library science program. It would be better for the relevance of the library science field to be creating a framework for this type of program. But I am sure other areas and programs are looking into this also. Partner where ever possible and libraries should take the lead in this.
The training would take different forms -- but this needs to be done to ensure all professional librarians have some training in data management.
We've already committed ourselves to do that here, and are already moving forward with it in a leading way at our institution.
Why not? It would fit within many programs at universities and colleges.
There are more academic libraries than library science programs and hopefully those libraries will be training their staff and faculty on data management.
For universities that do not have a slis program, they will need to create a training program on their own for graduate students and faculty at their university.
It can but must be a dedicated effort. SLIS programs can help, but libraries need to be specific and dedicated in their effort and support for research data management.
If there are staff to be trained, and trainers to do so (perhaps funded or provided by the NSF), then this can of course be implemented.
Not likely. We wouldn't have the staff, time, and resources to devote to this initiative
Training programs or training institutes can help some academic libraries to support research data management. The expertise required can come from various parts of the library - public services, technical services, IT, etc.
If you have librarians who are trained in research data management, then that should be sufficient. They may have to go to a library school to get that training, however.
Only large well-funded libraries at major institutions will be able to develop such programs. Most other libraries will need help.
This is a library and info science expertise with the help of Comp Sci

I don't think that library science programs are capable of handling the nuances of data in all subject disciplines. Subject informatics (or XInformatics, such as geoinformatics) is the primary driver of these programs. libraries can work with these training programs regardless of the library school. In fact you will have a hard time transitioning traditional librarians as well as traditional library professors.

I never think it is wise to depend on the LIS programs for training

sure, they can be implemented without library science programs. Libraries do not solely own data management -- many universities have bioinformatics departments that do similar (of course, the controlled vocabulary portion is a unique feature of library science programs)

It would be important for the librarians to have had training, whether their university has a library science program or not. Librarians could get the training and certification from other universities or agencies such as the Library of Congress.

We do not have the luxury of waiting for graduates to appear.

Yes, for training of curators and data managers in research labs and disciplinary faculties and staff. No, for training of librarians and information professionals, who should receive training in graduate degree programs.

There will be a need for library science programs to research and develop curriculum and training programs

In the forced-choice answer, 'maybe' is not offered as an option. However, it is possible that other groups could offer such training.

This will be necessary as more and more library science programs are closing.

Again, I wish I had the option to answer "undecided," although my answer here would be "undecided - favorable." If institutions' research administrators and offices partner with libraries to develop institution-specific data management plans or strategies that all researchers will comply with (to varying degrees, of course, based on needs and funder requirements), then I believe training programs organized and run by libraries have a chance of being successful. However, there will likely need to be strong, unified institutional support for such training very clearly coming from research administrators in order for this to work.

Probably, but not sure where responsibility would lie...

While I do think academic programs would be useful, I do not think they are absolutely necessary. Academic librarians can collaborate with the RCR (responsible conduct of research) courses required for graduate students.

It would seem to be able to stand separately from library science.

Best practices approach - particularly since LIS programs seem unwilling to focus on the practical and continue to emphasize more theoretical aspects of librarianship.

Possible--"yes." Probable--"no" given the resource constraints under which most libraries operate these days. Effective training programs are likely to require more personnel than most libraries--even research libraries--can muster.

They could be developed individually, sure, but it would be better for the profession to do it through the current masters programs and offer internships or even whole courses at specific institutions through those programs.

The practitioners who are required to provide the research data management often have a wealth of knowledge that can be shared.

It's possible. It might be comparable to digitization programs that are sponsored by libraries. Not all library schools have courses on how to digitize a collection, etc.

We were recently awarded a grant with another university in town to do just this, i.e. put together a curriculum on research data management for undergraduate and graduate students. Neither university is one with a library science program. It is not necessary.

I would expect a data librarian or data curator to be able to offer training sessions for faculty and students just as other librarians offer instruction on other topics.

While on-the-job training is necessary, there also should be a substantial theoretical component. We need people trained not only in the practice of data management, but also in the theory.

Yes, with vision, and leadership, and university commitment of required resources.

Yes, if there are librarians who are actively keeping up with the literature and technologies, and if it's explicitly a part of their jobs (accompanied by compensation).

LIS faculty don't have a monopoly on this knowledge. Both practicing librarians and LIS faculty are educators. Practitioners may well be closer to the ground than LIS faculty. As I said above, I think that existing degree programs are disconnected from the breadth of a campuses needs.

3.8. Question 8

How would you rank the following in terms of their importance to cultivating necessary competencies in research data management? Indicate importance by checking the button for critical, very useful, useful, somewhat useful, or negligible across from each example. You may use the text box to suggest other possible ways to build competency in research data management.

3.8.1. Implement an institution-wide research data management policy, including templates for researchers to use to describe this policy in their grant proposals

Answer	Count	Percentage
Negligible	2	3.1%
Somewhat Useful	1	1.5%
Useful	11	17.2%
Very Useful	25	39.1%
Critical	25	39.1%
Total	**64**	**100%**

3.8.2. Provide training workshops and instructional resources for researchers across the university in best practices for research data management

Answer	Count	Percentage
Negligible	0	0.0%
Somewhat Useful	3	4.7%
Useful	8	12.5%
Very Useful	26	40.6%
Critical	27	42.2%
Total	**64**	**100%**

3.8.3. Embed librarians within departments and research centers in order to study and better advise research data management practices according to researchers' behavior and needs

Answer	Count	Percentage
Negligible	1	1.6%
Somewhat Useful	9	14.3%
Useful	13	20.6%
Very Useful	29	46.0%
Critical	11	17.5%
Total	**63**	**100%**

3.8.4. Support certificate or fellowship programs that enable students in all disciplines to work directly with library personnel in research data management

Answer	Count	Percentage
Negligible (1)	1	1.5%
Somewhat Useful (2)	13	20.3%
Useful (3)	24	37.5%
Very Useful (4)	20	31.3%
Critical (5)	6	9.4%
Total	**64**	**100%**

Respondents' Comments on Question 8 (N=17)

Advocate to library administrators for librarians as data-management resources! Where I am, library admin is FAR from convinced they should care, or let us care.

Separate archival data education from LIS schools. The Information Science curriculum is already a mess, making archival education part of something that is already broken, is only going to doom it to failure.

The strategy needs to be built so that it fits within current research patterns- designing a separate program on data curation is not likely to be compelling for most researchers.

Integrate the concept into existing curriculum to be sure it's not too "boutique-y". I see data as just an extension of the previous research publishing paradigm/system. While it has very distinct features I think it's just part of scholarly communication and should be treated as such. Don't silo-ize it - give it context and exposure by putting it in other related areas.

Support curricular changes that embed training in data management into "Intro to research" classes across all fields.

Work across disciplines and develop an understanding of different processes and timeline for each discipline in terms of creating, and publishing research and data.

Work with the Research office to create training videos and other materials for researchers to watch/use.

We are already pursuing the first two of these with our campus Office of the Vice President of Research and researchers.

Offer and support seminars to increase awareness of practices and technology advances that support the management of research data.

An overall comment: As you stated earlier, "This October, the National Science Foundation (NSF) began requiring detailed data management plans in all grant proposals, in an effort to ensure that the research data produced from these projects are widely available and accessible to research

communities.", citing NSF Press Release 10-077. I am as certain as I can be that unless and until researchers and/or institutions are required to *act* on those plans in specific ways that ensure that the data is preserved and usable by others, not much will happen, regardless of the training, services, and infrastructure we might provide. Human nature coupled with the inherent difficulty of doing a good job at data management will keep this from happening without measurable incentives. These might come from the NSF (perhaps in some form of mandate stating that if you're not making your data available from the last study the NSF funded, new funding will not be available) or the researchers' institutions. The challenges and costs of research data management are too significant for this to happen on its own.

At this point, data in the sciences can be huge and extremely complex. Hence, I don't see the utility of embedding a librarian in a given department. Yes, librarians can be a resource for "best practices etc" but in a more general sense. At this point, it doesn't seem a good use of a Librarian's time to be embedded in one department or center.

I don’t think that embedding a librarian within the group will work well...the data life-cycle can be very drawn out. I think it’s important for librarians to work with researcher when developing the plan (at the beginning) and then later in the publication and distribution stage of the data sharing. In the middle would be awkward, and at best librarians would be asked to do the menial work of keeping the digital files clean and organized. We need to demonstrate ourselves as experts in things we are actually experts in. With clearly defined services, we can be there at the onset, and work throughout the process as needed. Then again, this will vary per discipline.

Research data are so diverse that one "institution-wide policy" may do more harm than good. Not sure if this is my last place to comment, but... Too often people read "the sky is falling" into the NSF Data Management Plan. For years, many researchers have been stating their plans and have well-established discipline-specific repositories for their data. The new requirement simply specifies that there must be a plan (and, at this point, doesn't mandate open access one way or another). That said, the library can play a key role in guiding and supporting researchers, especially those with "orphan" data sets.

I really doubt that labs in our environment (health sciences) are going to be interested in certification of data curators and stewards. Certification seems more appropriate for librarians and information professionals.

It would be extremely difficult to implement an institution-wide policy at my research university. Also, the requirements of different funding agencies and discipline communities are very different.

Library schools should seriously consider requiring students to perform original research as part of their degree requirements. This would give practical knowledge and experience in the research process, including creating and managing data through its life-cycle.

Experience has shown many times that workshops for faculty/students have limited uptake, regardless of topic or approach. You need just in time help much more than extensive workshop programs.

4. Summary

This report presents the results of the survey and does not provide any further analysis or interpretation of the numeric results or the respondents’ comments. The researchers will prepare an article for publication in which such interpretations and findings are presented.

Attachment A: Survey Questionnaire

Section 1: Librarians' Priorities in Managing Research Data

While scholarly publications have long been the foundation on which scholarship is built, scholars today increasingly rely on research data for sharing and constructing new knowledge. This **research data** (also called **digital data**) is the digital information developed by scholars through their research, and may include data sets, digitized images, and other digital resources used and produced in the conduct of scholarship. Scientists are often recognized as users and producers of research data (for example, the datasets describing the composition of DNA strands in the Human Genome project), but humanities scholars also use and create datasets and digital objects in the course of their research (the Trans-Atlantic Slave Trade database being one example).

Managing research data (or **research data management**) is defined broadly in this survey as the processes, skills, and knowledge necessary to providing long-term access and widespread availability to the digital data developed by scholars through their research.

Question 1: *Do you believe librarians should play a role in managing researchers' digital data?*
Choose one of the following answers

- Yes
- No

Question 2: *Using the following scale, indicate the degree to which you believe librarians should be involved in managing research data.*
Choose one of the following answers

- 1 = not at all (researchers are solely responsible for research data management)
- 2 = somewhat (researchers play a greater role, but librarians assist with research data management)
- 3 = equally (librarians and researchers share responsibility for research data management)
- 4 = mostly (librarians play a greater role, but researchers assist with research data management)
- 5 = completely (librarians are solely responsible for research data management)

Question 3: *Does your library anticipate investing in new library positions and/or infrastructure within the next 5 years to support research data management?*
Choose one of the following answers

- Yes
- No
- Don't know

Section 2: Librarians' Role in Managing Research Data

This October, the National Science Foundation (NSF) began requiring detailed data management plans in all grant proposals, in an effort to ensure that the research data produced from these projects are widely available and accessible to research communities. Speaking of the importance of this data to further research and innovation, Jeannette Wing (assistant director of NSF's Computer and Information Science and Engineering directorate) stated, "The change reflects a move to the Digital Age, where scientific breakthroughs will be powered by advanced computing techniques that help researchers explore and mine datasets. Digital data are both the products of research and the foundation for new scientific insights and discoveries that drive innovation" (NSF Press Release 10-077).

Given research data's value as the both the product and progenitor of scholarship, and the increased demand on researchers to make this data widely available and accessible, **what should the role of librarians be in research data management?**

Question 4: *What kind of role should libraries and librarians play in managing the data produced by researchers?*
Indicate how necessary each of these roles are likely to be at your institution by checking the button for "critical," "very useful," "useful," "somewhat useful," or "negligible" across from each example. Use the text box provided to note other roles not already listed, or to comment on your selections.

	Negligible	Somewhat Useful	Useful	Very Useful	Critical
Informational (directing scholars to resources that will help them manage their own research data)	○	○	○	○	○
Instructional (providing training in the tools and information necessary for curating research data)	○	○	○	○	○
Infrastructural (providing space and resources for storing and accessing research data)	○	○	○	○	○
Cooperative (making tools and other resources available for scholars' use in managing research data)	○	○	○	○	○
Collaborative (actively participating in and guiding scholars' research data management)	○	○	○	○	○
Archival (preserving and providing access to research data, once a scholar or research project no longer resides at the university)	○	○	○	○	○

Please note other qualities of this role not already listed, or comment on your selections (Comments)

Question 5: *What specific roles should the library play in order to make research data widely available and accessible?*
Indicate how necessary each of these roles are likely to be at your institution by checking the button for "critical," "very useful," "useful," "somewhat useful," or "negligible" across from each example. You may suggest other possible roles for the library in the text box provided.

	Negligible	Somewhat Useful	Useful	Very Useful	Critical
develop a technical infrastructure for preserving and providing access to data produced by researchers at the university	○	○	○	○	○
create dedicated data management and development positions or departments to advise researchers in storing, managing, and ultimately providing access to their research data	○	○	○	○	○
support training and certification programs in research data curation, for researchers and students across disciplines	○	○	○	○	○

If you believe there are other roles the library might play, suggest them here (Comments)

Question 6: *Should library science programs and academic libraries work together to provide certification opportunities in research data management, for researchers and students across disciplines as well as library professionals and librarians in-training?*
Please explain your answer in the text box provided.
Choose one of the following answers

- Yes
- No

Please comment on your answer (Comments).

Question 7: *Do you believe training programs in research data management can be implemented at academic libraries without library science programs?*
Please explain your answer in the text box provided.
Choose one of the following answers

- Yes
- No

Please comment on your answer (Comments)

Section 3: Building Competencies in Research Data Management

In 2006, the Institute for Museum and Library Services (IMLS) funded a 3-year project around the construction of an international digital curation curriculum. Called DIGCCURR, this project has just published its final report in which it makes several recommendations for training information science graduates in digital curation, including the need for providing students with hands-on professional experience with the digital asset lifecycle (DIGCCURR I Final Report, p. 11). Another IMLS-funded project currently underway, *Building the Future of Archival Education and Research* (http://aeri.gseis.ucla.edu/index.htm), is an inter-institutional effort to build competencies among archival faculty, including a focus on digital curation.

These and other curriculum-development projects focus predominantly on the enhancement of information science programs. As their work moves forward to train future LIS graduates in digital curation, **how should *libraries* as well as information science programs begin to encourage and cultivate competencies in research data management?**

Question 8: *How would you rank the following in terms of their importance to cultivating necessary competencies in research data management?*
Indicate importance by checking the button for "critical," "very useful," "useful," "somewhat useful," or "negligible" across from each example. You may use the text box to suggest other possible ways to build competency in research data management.

	Negligible	Somewhat Useful	Useful	Very Useful	Critical
implement an institution-wide research data management policy, including templates for researchers to use to describe this policy in their grant proposals	○	○	○	○	○
provide training workshops and instructional resources for researchers across the university in best practices for research data management	○	○	○	○	○
embed librarians within departments and research centers in order to study and better advise research data management practices according to researchers' behavior and needs	○	○	○	○	○

support certificate or fellowship programs that enable students in all disciplines to work directly with library personnel in research data management	○	○	○	○	○

Please suggest other possible ways to build competency in research data management (Comments).