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2016 e-Science Symposium

Apr 6th, 12:00 AM

Data Information Literacy: Developing Data Information Literacy Programs

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Repository Citation

Carlson, J. (2016). Data Information Literacy: Developing Data Information Literacy Programs. *University of Massachusetts and New England Area Librarian e-Science Symposium*. <https://doi.org/10.13028/pr81-wk39>. Retrieved from https://escholarship.umassmed.edu/escience_symposium/2016/program/6

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Developing Data Information Literacy Programs

Jake Carlson

Research Data Services Manager

University of Michigan Library

Background

Carlson, J., Fosmire, M., Miller, C. & Sapp Nelson, M. (2011). [Determining data information literacy needs: A study of students and research faculty](#). *portal: Libraries and the Academy*, 11(2). 629-657.

Data Processing and Analysis	Data Curation and Re-Use
Data Management and Organization	Data Conversion and Interoperability
Data Preservation	Data Visualization and Representation
Databases and Data Formats	Discovery and Acquisition
Ethics and Attribution	Metadata and Data Description
Data Quality and Documentation	Cultures of Practice

Data Information Literacy Grant



- What knowledge and skills with data will graduate students need to be successful?
- What roles could librarians play in teaching these skills?

5 Case Studies:

<http://docs.lib.purdue.edu/dilcs/>



Semester Long DIL Courses



- Taught with Marianne Stowell Bracke, Ag Librarian
- Not for credit
- Students had to apply and were given stipends by the College of Ag



- Taught with Sara Samuel, Engineering Librarian & Joanna Thielen, ULA
- 2 credit special topics course offered through the CLaSP department

Observations



- Overall, the DIL competencies are seen as important for students to develop.
- Overall, students do not receive formal training and are seen as lacking in DIL competencies.
- Assumption that students should have acquired these competencies.
- Lack of formal policies in the research team.
- Self-directed learning through trial and error.
- Focus on data mechanics over deeper concepts.

Foundational Approaches



We believed that our program should:

- Center on the student's role as data producer and manager
- Be contextualized through disciplinary standards and practices
- Have students use their own data

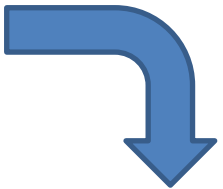
DIL Model



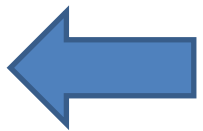
Planning: Env Scan



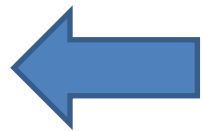
Planning: Interviews



Assessment



Implement Program



Develop Educational Program

Environmental Scan



Getting to know disciplinary culture better through exploring:

- Standards – Metadata, Formats, etc.
- Repositories – content, context
- Journal Publishers – policies, practices
- Scholarly Organizations – statements, conferences
- Literature Review

Image:
<https://www.linkedin.com/pulse/20140529232309-1443605-doing-environmental-scanning-part-1-focus-your-scanning>

Interviews



Two possible purposes:

- Local cultures of practice
- Understand perceptions & priorities

Who to interview

- Faculty
- Students
- Other Stakeholders

Image:

<https://www.linkedin.com/pulse/20140529232309-1443605-doing-environmental-scanning-part-1-focus-your-scanning>

Data Information Literacy Competencies

Data sharing

Skills may include:

Recognizes that data may have value beyond the original purpose, to validate research, or for use by others. Is familiar with the practices, values, norms and resources of his/her chosen field, discipline, or sub-discipline as you relate to sharing data. Understands and complies with data sharing mandates from funding sources. Knows how to cite a data set.

Please indicate how important you believe it is for you to be knowledgeable in this competency by the time you graduate:

1	2	3	4	5
Not important	Somewhat important	Important	Very important	Essential

I don't know or NA

How would you describe your knowledge and skills in data sharing currently?

1	2	3	4	5
Deficient	Needs Improvement	Acceptable	Proficient	Outstanding

I don't know or NA

Develop the Program





Image: <http://nesit.org/nesit-build-party-1/>

- Analyze the information you have collected
- Allocate Resources
 - Time
 - People
 - Space
- Develop Curriculum
- Manage Expectations

Outline for CLaSP 605

Resources

[Syllabus_2016-02-25.pdf](#)  

Week 1: Introduction and What is Data? (January 7)

Week 2: Data Discovery and Being a Good Data Consumer (January 14)

Week 3: Data Management Planning (January 21)

Week 4: Data Storage Considerations and Costs (January 28)

Week 5: Data Documentation and Organization (February 4)

Week 6: Metadata (February 11)

Week 7: Visualization (February 18)

Week 8: Data Lifecycle and Workflows (February 25)

Spring break - March 3 (Enjoy!)

Week 9: Data Sharing (March 10)

Week 10: Data Curation and Preservation (March 17)

Week 11: Intellectual Property, Licensing, and Attribution (March 24)

Week 12: Ethics (March 31)

Week 13: Presentations (April 7)

Week 14: Presentations and Review (April 14)

Time:

2 hour class – 14 Weeks

People (Guest Speakers):

- IT Specialist
- Data Visualization Expert
- Copyright Officer
- Director of Compliance

Space:

- Design Lab (In Library)

Implement the Program



Image: <http://appcessful.com/>

- Use active learning and peer networks
- Flexible, responsive and student-driven
- Consider your stakeholders

Lesson Plan from CLaSP 605

Week 3: January 21

Topic: Data Management Planning

Increasingly, funding agencies are requiring that researchers develop a data management plan to explain how they will develop their data set over the course of their research, how they will make their data available to others who may wish to view or use it themselves and how they will ensure long-term access to their data. In this session we will talk about these requirements and why they have come to exist, but more importantly we will talk about what comprises good data management planning more generally and how developing a plan can make one's life easier.

Learning Outcomes:

- Students will be able to identify the components of a data management plan as defined by funding agencies such as the NSF, NASA and others.
- Students will be able to identify additional considerations in data management planning that may be relevant for their own research.
- Students will be able to apply their knowledge of data management planning in ways that satisfy the requirements of funding agencies, expectations of their research communities, and the environment of the laboratories in which they are working through developing effective data management plans.

Readings:

- ["Jim Gray on eScience: A Transformed Scientific Method"](#) [↗](#) *The Fourth Paradigm* (pgs xvii - xxxi)
- White House Office of Science and Technology Policy February 2013 memo on ["Increasing Access to the Results of Federally Funded Scientific Research"](#) [↗](#)
- Briney. Chapter 3: Planning for Data Management (pgs 16-34). ([Read online](#) [↗](#))
- Michener WK (2015) ["Ten Simple Rules for Creating a Good Data Management Plan"](#) [↗](#). *PLoS Comput Biol* 11(10): e1004525. doi:10.1371/journal.pcbi.1004525

Optional reading:

- Inter-university Consortium for Political and Social Research (ICPSR) ["Guidelines for Creating Effective Data Management Plans"](#) [↗](#)

Reflection: [Week 3 Reflection: Data Management Planning](#)

Homework: [Homework 3: DMP Initial Draft](#)

Slide Deck: [Data Management Planning Session Presentation](#) [↗](#)

Assessment



Image:

<http://caringenemies.blogspot.com/2012/02/wonders-of-career-assessment.html>

Formative:

- Initial Survey
- Assignments
- “Minute Papers”

Summative:

- End of Semester Focus Group
- Six Month Follow-up Interviews

Impact of the Course

‘...thinking about the data life cycle... I’d never really thought... past publication.. [but] you make more data than you need and it has value for other people. So I think that was an eye opener.’

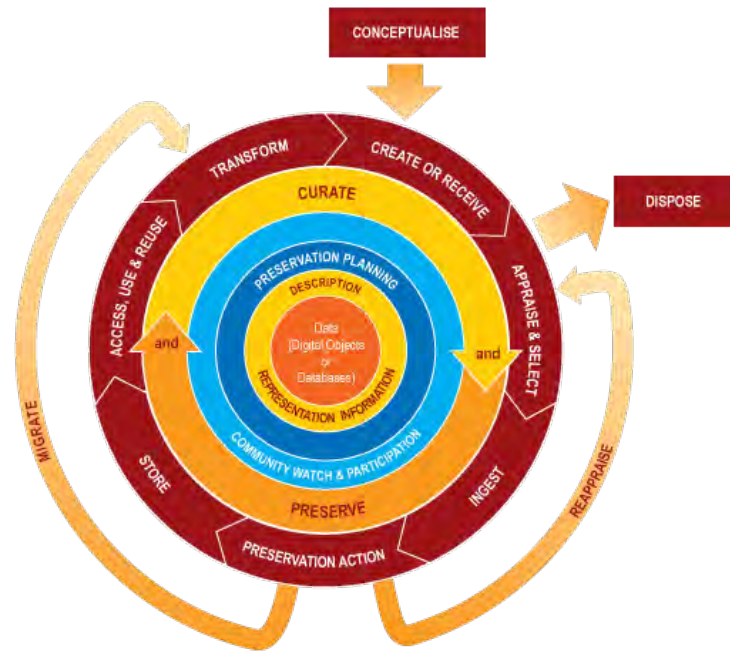


Image: DCC Curation Lifecycle Model:
<http://www.dcc.ac.uk/resources/curation-lifecycle-model>

Lessons Learned



‘I thought it was valuable to see the big picture, but I agree [start with] the hands on. I was really uncomfortable trying to start with the big picture. I felt like I was drowning.’

Image credit: “Bigger is Better” https://www.flickr.com/photos/zachd1_618/5010039548

Why engage in DIL?

- It's a service that's needed – locally and externally.
- Entry point for building relationships with graduate students and faculty.
- It's a way to gain a better understand how research is practiced.
- It's a means to increase the impact of the library.

DIL Project Personnel

Principal Investigator:

- Jake Carlson – University of Michigan



Co-Principal Investigators:

- Camille Andrews – Cornell University
- Marianne Stowell Bracke – Purdue University
- Michael Fosmire – Purdue University
- Jon Jeffryes – University of Minnesota
- Lisa Johnston – University of Minnesota
- Megan Sapp Nelson – Purdue University
- Dean Walton – University of Oregon
- Brian Westra – University of Oregon
- Sarah Wright – Cornell University

Scenarios Exercise

1. At your tables, get into groups of 3-4 people.
2. Read through the scenario
3. Answer the following questions
 - What DIL related needs do you see in your scenario? What additional information would you want to collect?
 - What would your DIL program consist of? What might some of your learning objectives be?
 - How might you structure your program? Include considerations for time, space and people.