# Data Curation Education in Research Centers: Formative Evaluation Findings from Years One and Two

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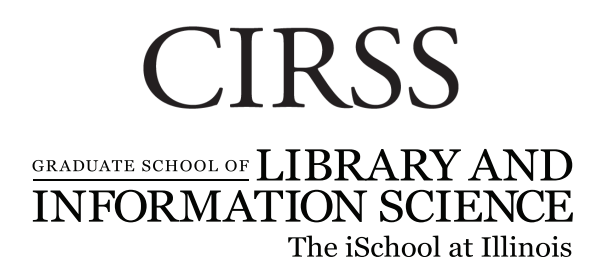
## Data Workforce Problem

The current data curation workforce consists primarily of:
- Scientists and technical experts who receive little formal training in data management
- Data managers educated through on-the-job training

Few education programs exist that provide formal training specifically related to data management and curation.

## DCERC Model

DCERC is developing a new model for educating data professionals that:
- Introduces library & information science students to data curation practices and issues in a research center environment.
- Designs and delivers foundational courses in data curation.
- Provides Masters and Doctoral internships at a data-intensive research center.
- Builds community among students, science and data mentors, and faculty.
- Contributes to data curation research results, documentation of curation best practices, and advances in practitioner training.

## Masters Internship Experience

- Masters students intern at NCAR for two months in summer.
- Summer internships are launched with an introductory workshop.
- Students learn current data management practices and challenges while developing expertise and conducting research.
- Each student is paired with two mentors:
    - Data mentor – provides data management expertise
    - Science mentor – provides expertise of the scientific domain, and real-life data management challenges

## Formative Evaluation Questions

- How well does the internship experience match the needs of the students? The mentors?
- Which elements of the internship did the students find most valuable? Least valuable?
- Which areas of the internship experience can be improved?

## Data Collection Methods and Sources

- Participants: 5 Master's students and 12 mentors from 2012 & 2013 internships.
- Student feedback: Pre-internship survey; a post-workshop survey, student e-journal entries; post-internship survey and focus groups.
- Mentor feedback: Post-internship survey and focus groups.

## Participant Feedback and Program Adjustments

### Year One Feedback

- Positive experiences
    - Foundational course and internship experience were extremely valuable, and in line with student career objectives.
    - Students described their mentors as great, accessible, supportive, and enhancing the learning experience.
    - Mentors appreciated the information science perspective.
    - Students valued professional development opportunities.
- Adjustments needed:
    - Opening workshop, while informative, was overwhelming.
    - Student project organization needed improvement:
        - Students needed better orientation to NCAR or mentors.
        - Mentors had limited understanding of student skills.
    - Internship timelines were very tight.

### Year Two Adjustments

- Do more project development before the students arrive:
    - Earlier pairing of students with mentors.
    - Discuss possible projects with students and mentors.
- Streamline kickoff workshop to focus on student projects.
- Evolve project aims and activities:
    - Seminars on NCAR science and engineering.
    - Combine final poster presentations with other NCAR internship programs.
- Provide additional professional development opportunities:
    - Visit to National Snow and Ice Data Center.
    - Attend Science Boot Camp for Librarians.

### Year Two Feedback

- Positive experiences
    - Projects had better alignment between student/mentor goals and student skills.
    - Students valued the additional professional development opportunities.
    - Mentors appreciated the students' analytical approaches.
- Adjustments needed
    - Mentors noted the significant time commitment.
    - Data mentors stressed importance of computing skills, which Library & Information students may not have.

### Year Three Adjustments

- Give mentors opportunity to provide feedback on student applications.
- Develop projects early, before the students arrive.
- Provide additional professional development opportunities:
    - Participate in upcoming GeoData II meeting.
    - Visits to local data centers.
- Work with mentors to identify the variety of skills involved in data curation:
    - Skill spectrum model.
    - Guide intern projects.
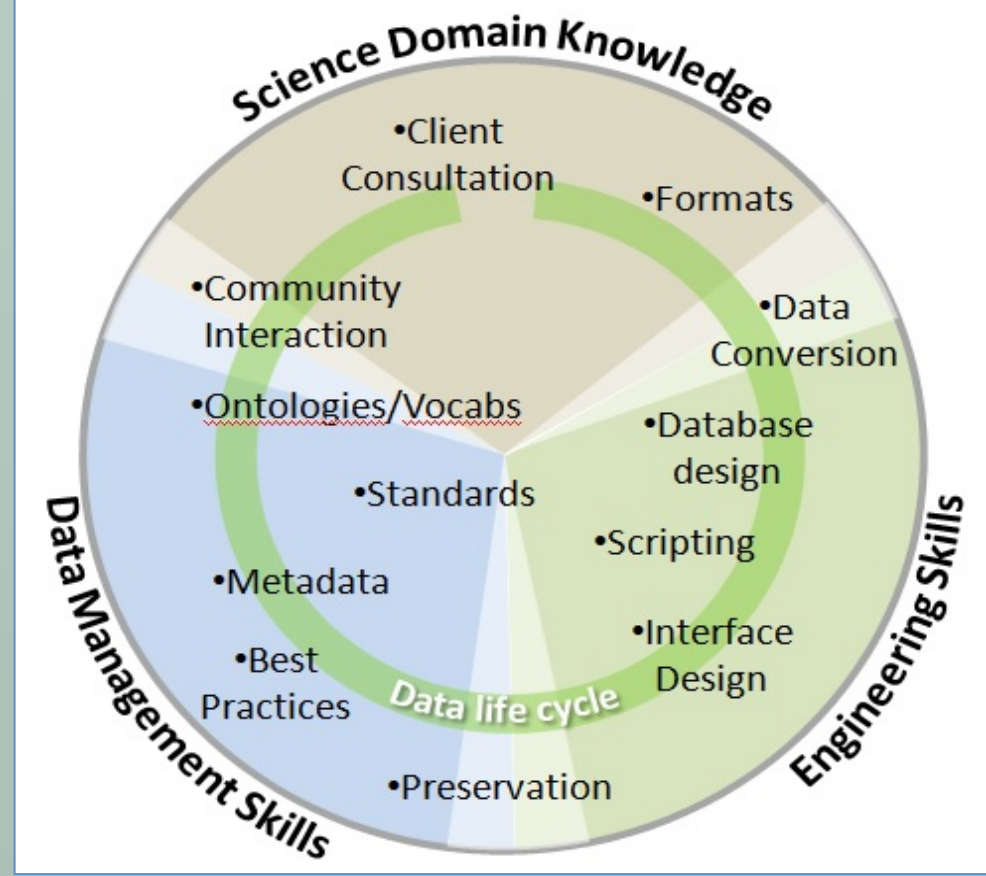
### Testimonials

*"I had a chance to follow the complete data curation process rather than doing one piece... I had a chance to see the big picture and appreciate the time and energy it takes to do the job right."* - Student

*"I learned how the new generation of data curators thinks, designs solutions, and how they perceive the expected audience of their work."* - Mentor

## Next Steps

- Additional cohorts of Master's students at NCAR in 2014.
- Evaluate the sustainability of the internship model over time within a research center environment (e.g. NCAR).
- Investigate need for data curation expertise & viability of internship program with broader set of scientific data centers.
- Continue to inform curriculum development with evaluation results.
- Extend and sustain the DCERC model beyond the initial partnership.