UNLOCKING DATA MANAGEMENT
A Curriculum for Undergraduate Research Assistants

MICHIGAN STATE UNIVERSITY

HAILEY MOONEY ◆ mooneyh@msu.edu
AARON COLLIE ◆ collie@msu.edu
SHAWN NICHOLSON ◆ nicho147@msu.edu

(UNDERGRADUATE RESEARCH EXPERIENCE + LIBRARIAN & FACULTY COLLABORATION) X RESEARCH DATA MANAGEMENT = SUCCESS

THE STUDENTS

- **Undergraduate Research:** Three students are employed as research assistants with a social work professor
  - Research is focused on mental health recovery
  - Involves the Recovery Enhancing Environment survey in partnership with Community Mental Health
  - Conceptualization, planning, and design phase

"real world" research experience

UNDERGRADUATE RESEARCH EXPERIENCE

BENEFITS

- Provides students the opportunity to actively engage in research with faculty mentors
- Contributes to faculty research projects or develop independent projects
- Student researchers may be employed as research assistants, given academic credit, or serve as volunteers
- Student researchers may be employed as research assistants, given academic credit, or serve as volunteers
- Students explore their own questions based on faculty data and are given the opportunity to present their findings at the University Undergraduate Research & Arts Forum
- "Demystifies" the research experience

CHALLENGE

- Seeing the "Big Picture": Students may work only on a specific part of the research lifecycle for a limited time

THE LIBRARIANS & FACULTY

- **Meaningful Collaboration:** Three librarians collaborated with a social work professor to coordinate a shared agenda
  - Visionary: Assistant Director for Digital Information
  - Subject Specialist: Data Services & Social Work Librarian
  - Digital Librarian: Digital Curation Librarian
- **Embedded Librarianship:** Librarians joined URE group as instructors and participant observers; attended biweekly meetings over the course of the 2011–2012 academic year
- **Flexible Curriculum:** Librarians regularly adjusted curriculum based on student feedback (oral feedback, minute papers, student comprehension)

partnering for success

LIBRARIAN & FACULTY COLLABORATION

BENEFITS

- Faculty gets additional input/ assistance with her research project
- Librarians learn more about how faculty do research and how the URE works
- Positions librarians as partners in the scholarly enterprise

CHALLENGES

- Thorough buy-in from all parties
- Maintaining communication
- Flexibility in connecting with changes in the research project

A RESEARCH DATA MANAGEMENT CURRICULUM FOR UNDERGRADUATES

INTRODUCTION TO LITERATURE MANAGEMENT: ZOTERO
- Practical: A tool for collecting, organizing, and annotating references
- Conceptual: Data management concepts applied to citation management

LITERATURE AND DATA
- Conducting literature reviews
- Evaluating sources
- Identifying data sources and secondary analysis in research articles

PLANNING FOR PROJECT AND DATA MANAGEMENT
- Project parameters
- File plans
- Naming conventions
- File formats
- Short term storage

DATA COLLABORATION AND SHARING
- Project collaboration
- Project documentation
- Metadata
- Data sharing

ARCHIVING AND REPORTING ON RESEARCH DATA
- Data publishing
- Data citations
- Data presentation: posters for UURAF
- Long term storage

the research lifecycle process revealed

Michigan State University LIBRARIES

THE CURRICULUM

- **Unlocked RDM:** Librarians lead faculty and students through a distilled Research Data Management curriculum
- **Applied Research:** Applies RDM best practices to particular research problems

RESEARCH DATA MANAGEMENT

BENEFITS

- Reveals the complete research lifecycle process for students
- Saves time by improving efficiency & organization
- Provides faculty with an outline to develop data management plan
- Provides students with resume-boosting skills

CHALLENGES

- Are librarians equipped?
- Filter to make relatable to students
- Balance: general vs. specific
- Communication: guide vs. provide
- Best practices are not a low barrier (may be difficult to implement)

INSIGHTS & OUTCOMES

Students develop understanding necessary to be conscientious researchers concerned about research data management and positive contributors to the evolving system of scholarly communication.

- Develops practical skills that make students more efficient researchers
- Builds understanding of ethics of proper data management
- Enhances marketability for future employment
- Students are more likely to consider long term preservation, data sharing, and data citation in future research
- Provides foundational knowledge for contribution to data-intensive science

Develops awareness, enhances understanding, and builds capacity:

- For the research team
  - workflow and data management
- For the Librarians
  - researcher needs and behavior
- For the University
  - data management storage and preservation infrastructure and support

CHALLENGES & FUTURE WORK

- Assessing efficacy of the modules
- Scaling delivery
- Enhancing librarian/faculty collaboration
- Increase understanding and engagement of specific disciplinary research practices

"This experience has showed me what the beginnings of a research project looks like and what kind of decisions need to be made way before you can start your research project."

"Working as an undergraduate research fellow gave me an inside understanding of the complex and iterative process that is foundational to academic research.... Just as most academic research is a conversation between past and present literature, the research process is less linear than it is circular; every phase of the research has the potential to affect a later step."