

Investigating Civil and Environmental Engineering Research Practices:

a Grounded Theory Approach

Carnegie Mellon University Libraries

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Introduction

- This research is part of a larger project conducted across several institutions by Ithaka S+R.
- This study focuses on understanding the research practices of faculty in the Civil and Environmental Engineering field.
- A series of semi-structured interviews were conducted with faculty researchers.
- Qualitative research methods (Grounded Theory approach) were used to analyze results from the interviews.

CEE at CMU

- Carnegie Mellon University (CMU) is a private institution that is known for its programs in science and technology.
- The CEE department offers Bachelor of Science (BS), Master of Science (MS), and PhD degrees.
- The department is known for:
 - intelligent infrastructure systems
 - water and air quality science and engineering
 - resilient engineering materials
 - sustainable engineering practices
- U.S. News and World Report ranks CEE:

Environmental Engineering program 8th

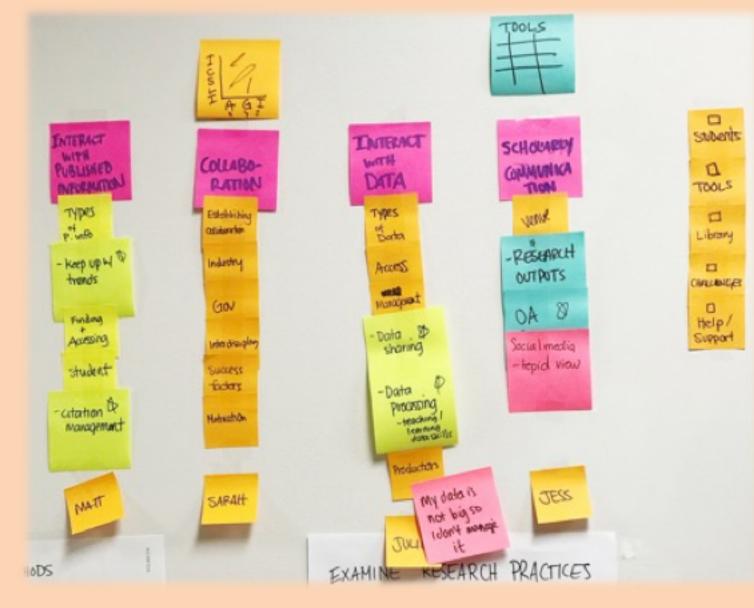
Civil Engineering 10th

Research Process and Key Findings

Project start



Paper notes were used to organize findings from open coding. The research team met and discussed these findings, fitting them to different themes.



Findings were arranged in various ways to finalize the themes and the code book.

Recruit

Open

Theme

Coding

Professor 67% N=9 Recruiting results

Grounded Theory Approach

Interview

Semi-

structured

interviews

Coding

Identified Themes:

- Collaboration
- Interact w/ data
- Interact w/ published information
- Scholarly communication

Codebook examples:

Interact w/ data

- Types of data
- Management
- Data sharing
- Data access
- Scholarly communication
- Research outputs
- Open Access
- Social media
- Venue



White board in an interviewee's office Old ideas are kept for a long time.



Data Server in an interviewee's office Some research data is stored on the server.

Key findings:

- Most CEE researchers are doing interdisciplinary research.
- There is significant collaboration between faculty across and within CEE at CMU. No one works in a silo.
- All researchers interact with data, either as products or an information source. The size of data vary from 20-30 entries per project to terabytes data per week.
- Researchers tend to publish in open access when it is required or meets their quality/audience criteria, but most felt constrained by traditional metrics of scholarship.

Next Steps

- Write a local report as part of the broader Ithaka S+R project.
- Draft an independent journal article with our research findings.
- Use the same approach to conduct similar research in other science and engineering fields.
- Write a book chapter on the collaboration process