“THE HOW AND WHY OF RESEARCH: WHAT IS THE ROCK IN YOUR SHOE?”

PART 2: “FROM CURIOSITY TO CONCEPT: DEVELOPING A RESEARCH PLAN FROM EVERYDAY LIBRARY ISSUES”
Introduction

- Your host: Steve Knowlton
- Collection Development Librarian, University of Memphis
- Member of editorial board for *Library Resources and Technical Services*
“How We Done It Good”

- Writing a research article based on work you’re already doing in the library
- One of the most important types of library literature
  - Share good ideas with colleagues
  - Provide a historical record of how libraries coped with challenges
Some Recent Examples


# Project Management vs. Research

## Some Fundamental Similarities

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<th>PROJECT MANAGEMENT</th>
<th>RESEARCH STUDY</th>
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<td>a. Determine needs</td>
<td>a. Define the Question</td>
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<td>b. Examine situation</td>
<td>b. Develop Hypothesis</td>
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<td>c. Try something new</td>
<td>c. Gather Data</td>
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<td>d. Assess if it works</td>
<td>d. Assess Hypothesis</td>
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Doing Your Project So It Becomes Research

- The sections of an article = the steps of your project
  1. Introduction / Research Question
  2. Literature review
  3. Formulate hypothesis
  4. Data collection
  5. Data analysis
  6. Discussion
  7. Conclusions
Step 1: Introduction / Research Question

- What's your problem?
  - Something needs fixing at the library
  - If it was obvious, you'd already be doing it
  - Define the problem

WELL, THERE'S YOUR PROBLEM
Project Management can be Research

- Using our Examples
  - Collection Development

- Project Management: members of our consortium duplicate a lot of holdings
- Research: what’s the ideal level of duplication for our consortium?
Project Management can be Research

- Using our Examples
  - Cataloging

- Project Management: need to reduce time spent contributing metadata to ETDs

- Research: which cataloger-provided metadata are truly necessary to findability?
Project Management can be Research

- **Using our Examples**
  - Instruction
    - Project Management: as part of ongoing assessment, need to measure effect of instruction sessions on students’ use of library
    - Research: what effect does research instruction have on students’ use of library?
Step 2: Literature Review

- Helps you understand what other people have done
  - If you find a solution that works for your library – your director will be very happy with you
  - You can put a twist on it and still write it up
  - Decide what you’re doing that’s novel
Step 2: Literature Review

How to find info

- **Library Literature and Information** (formerly Wilson, now EBSCO)
- **LISTA** (Library, Information Science and Technology Abstracts) – aka **LISTA**
- Conference Proceedings – often online
  - ALA
  - Charleston Conference
  - State Library Associations
- Don’t forget monographs
  - ALA
  - Libraries Unlimited (ABC/CLIO)
  - Scarecrow Press
Step 3: Your Hypothesis/Project Goal

- Literature review shows what’s been done successfully
- You consider those approaches in light of your problems
- Propose to solve your problem by trying an approach
Step 3: Proposed Solution = Hypothesis

- Based on your literature review, you believe that a particular approach will help solve your library’s problem.
- You can rephrase that into a research hypothesis: you believe that you will find a particular result.

Hypothesis can take many forms:
- Some things are more useful than others.
- There’s a connection between two things.
- Changing one thing will affect another thing.

- It must be testable.
- parsimonious.
- and fruitful.
Step 3: Proposed Solution = Hypothesis

- Using our Examples
  - Collection Development

- Background/Literature Review: author found a few other plans for cooperative collection of print titles

- Solution to problem: Develop a model that predicts the optimal number of holdings for a given title

- Hypothesis: my proposed model will result in a purchasing plan that accurately predicts needs within the consortium
Step 3: Proposed Solution = Hypothesis

- Using our Examples
  - Cataloging

- Background/Literature Review: authors identified a number of models for leveraging author-supplied metadata

- Solution to problem: Figure out which metadata elements are most important for findability, and only supply those

- Hypothesis: not all metadata are equally valuable for findability
Step 3: Proposed Solution = Hypothesis

- Using our Examples
  - Instruction

- Background/Literature Review: authors noted several different ways to evaluate library instruction

- Solution to problem: wanted to try something new, which was the use of library books after instruction

- Hypothesis: students who participate in library instruction use more library books in their research than students who do not participate
Step 4: Data Gathering

- Choice of research methods:
  - What you hope to discover guides your choice of tools

- 1. Collecting information: surveys
  - Polls
    - Be careful about sample size & randomness
  - Literature surveys
Step 4: Data Gathering

- **Choice of research methods:**

- 2. Studying effects: experimental methods
  - Determine baseline
  - Separate subjects into groups
  - Apply different effects to each group (maintain a control group which gets no treatment)
  - Repeat measurement to determine effects
Step 4: Data Gathering

- **Choice of research methods:**

- 3. Learning about behavior: Observation
  - Unstructured observation: watch, listen and take notes on the spot
    - Later categorize behaviors according to what you’ve observed
    - Try not to influence behavior with cues of approval/disapproval
  - Structured observation: use pre-determined categories or scales to record data
Step 4: Data Gathering

- Make appropriate categories
  - Determined by a single classificatory principle
  - Exhaustive of all possibilities
  - Mutually exclusive
  - Based on a sound knowledge of the subject matter and an anticipation of likely responses

Powell, 181-182.
Step 4: Data Gathering

Statistics

Validity: do your measurements really tell you what you think they do?

Reliability: will the test return the same results if performed again on the same data?
Step 4: Data Gathering

- Document EVERYTHING
- Key to other reproducing your results
- Keep a key to any color coding, etc.
Step 4: Data Gathering

- Using our Examples
  - Collection Development

- Hypothesis: my proposed model will result in a purchasing plan that accurately predicts needs within the consortium

- Research Method: Experiment
  - Computer simulation of his model for cooperative print purchasing
  - Compared to actual holdings
Step 4: Data Gathering

- Using our Examples
  - Cataloging

- Hypothesis: not all metadata are equally valuable for findability

- Research Method: Structured observation
  - Looked at all fields applied to ETDs / categorized them for easier analysis
  - Determined which ones contribute to findability
Step 4: Data Gathering

- Using our Examples
  - Instruction

- Hypothesis: students who participate in library instruction use more library books in their research than students who do not participate

- Research Method: Classic experiment
  - Established baseline of citations per paper
  - Divided students into two groups: one received instruction, one did not
  - Examined number of citations per paper in each group after instruction
Step 5: Data Analysis

- Remember those statistics?
- Data may appear to tell you a story, but do run proper tests
  - Remember, any judgment (inference) you make is based on Probability
Step 5: Data Analysis

- Line Graph
- Shows changes over time
Step 5: Data Analysis

- Pie Chart
  - Compare parts of a whole

Circulation by Location

- 78% from Math
- 18% from Music
- 61% from Audiology
- 1% from McWherter Audiovisual
- 1% from McWherter Books
- 1% from McWherter Equipment
- 0% from McWherter Government Publications
- 2% from McWherter Reserves
Step 5: Data Analysis

- **Bar Graph**
- Compare two different groups

### Total Circulation by Year

- **2010**
- **2011**

Step 5: Data Analysis

- **Area Graph**
  - Track changes over time in two or more groups
Step 5: Data Analysis

- X-Y Plot
  - Show relationships between two different sets of data

![CIRCULATION vs. TEMPERATURE](image-url)

- Graph showing the relationship between CIRCULATION and AVERAGE TEMPERATURE.
Step 5: Data Analysis

- Don’t Confuse CORRELATION with CAUSATION
- Identify “confounding factors”
Step 6: Discussion

- WHAT ARE YOUR FINDINGS?

- Did your project solve your problem?
  - What worked, what didn’t

- Did your data prove or disprove your hypothesis?
  - How do your findings compare to what you thought you would find, and what other people have found?
  - What does that tell you?
Step 6: Discussion

- What is the Difference Between “Discussion” and “Conclusion”?
  - Discussion does say what you “concluded”
    - Results of your test of hypothesis
    - Limitations of your study (sample size, insufficient ability to distinguish causation from correlation, etc.)
    - Comparison of your study to other similar studies
    - Future avenues of research (what do you wish someone had done before you started your study?)
Step 6: Discussion

- What is the Difference Between “Discussion” and “Conclusion”? (cont.)

- Conclusion tells reader what you learned from this research / how the project came out
Step 6: Discussion

- Using our Examples
  - Cataloging

- Answered question of hypothesis:
  - Identified 30,200 of 35,636 metadata that had a positive impact on findability and determined whether authors or catalogers supplied them

- Discussed research limitations
  - Sample size, sample origin, lack of inquiry into semantic appropriateness
Step 7: Conclusion

- Using our Examples
  - Cataloging

- Brief summary of research conclusions
- Comparison of those conclusions to results from other studies
- Anticipated effect of these conclusions on the library’s operations
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Further help

Tomorrow’s webinar: how to write up your research


The editorial board of your favorite journal!

Your presenters: sknwilton@memphis.edu