Which of these data collection methods have you used?

- Survey or Questionnaire: 21
- Focus Group: 8
- Interview: 13
- Observation: 10
- Field Experiment: 0
- Simulation: 0
- Mixed Methods: 6

58 votes - 22 participants
Designing a “Point of Selection” Study Using Simulations:
From Trailhead to Terminus

LG-81-15-0155
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  brannonb@oclc.org

@RSICStudy
our early trekkers
important links:

RSIC LibGuide: https://guides.uflib.ufl.edu/RSIC

Resource Hyperdoc: http://tinyurl.com/rsictrailhead

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introduction: basecamp
overview

Our study examines students’ “point of selection” behavior (i.e. the point at which an information seeker determines a resource meets their information need) and their judgements associated with the helpfulness, citability, and credibility of various online information resources. It also assessed students’ ability to identify the container (i.e. document type) in which the information is housed.
research questions

1. How do STEM students determine the credibility of online information resources?
   ○ What cues from a web search results screen do students use to judge the credibility of online information resources?
   ○ How do students’ characteristics influence their credibility judgments of online information resources?

2. Do STEM students differentiate among different types of online information resources during point of selection?
   ○ What cues from a web search results screen do students use to identify online information resources?
   ○ How do students’ characteristics and experiences influence their identification behavior?
Today’s trek

- Self-reported instruments
- Simulation
- Data Cleaning & Quality Control
- Codebook Creation
- Takeaways
- Q & A

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what was in our research pack?

Prescreen Survey

Interview Questions

Simulation of SERPs (not to be confused with sherpas!)

Think-Aloud Protocols
Self-reported instruments

Simulation

Data Cleaning & Quality Control

Codebook Creation

Takeaways

Q & A

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Prescreen survey

- Demographics
- Internet access and use
- Librarian help in the last two years
- Participation in follow-up study
our cohorts

29 Grades 4-5

30 Grades 6-8

26 Grades 9-12

30 Community College Students

30 Undergraduate Students

30 Graduate Students

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interview questions

Pre-Simulation
- Librarian/library interaction
- # of research projects in the last two years
- Their last research project
- Device use
- Social media use for school

Post-Simulation
- Confidence
- Care
- Container
Self-reported instruments

Simulation

Data Cleaning & Quality Control

Codebook Creation

Takeaways

Q & A

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What’s a simulation?

https://commons.wikimedia.org/wiki/File:Rollover_simulator_J1.jpg
Why a simulation?

https://commons.wikimedia.org/wiki/File%3ANeutral_Buoyancy_Simulator_cutaway.jpg
Partnerships: advisory panel

Representation:

- Public Librarian
- School Librarian
- Academic (Community College)
- Librarian Grade 4-5
- Instructor Grade 6-8
- Instructor Grade 9-12
- College Instructor
- University Instructor
advisory panel activities: research prompts and resource lists

One initial face-to-face meeting at UF

Formation of six small teams based on the cohorts of students used in study.

Several Google Hangouts working group meetings

Led by a member of the research team, small teams met virtually to:

- Establish a grade-level, standards-aligned research prompt for the simulation
- Determine appropriate number of resources to present in simulated results lists and number of resources participants would be asked to select from the results (cognitive load)
- Curate a list of appropriate resources for potential inclusion in each simulation for their educational levels
why a python?
why a python?

CHECKLIST

✓ single, controversial science topic
✓ regional interest
✓ understood by local participants
✓ realistically studied
✓ serious gore appeal!
resource selection

Methodic review of 483 potential resources to establish the 65 unique resources that would be used in the simulations.

Small teams searched for & identified potential resources targeting assigned cohort (graduate, undergraduate, community college, Grade 9-12, Grade 6-8, or Grade 4-5).

Google Drive Sheets to curate, access and review suggested titles. Moved to a single spreadsheet because of overlap

Resources reviewed by teams following dimensions of credibility:
- Currency/Timeliness
- Authority
- Objectivity
- Accuracy
- Good coverage
- Relevance.

Final sources selected based on teams’ 1-3 rankings
Research Prompt:
You have an assignment to write a science report that investigates the Burmese Python in the Everglades and describes the ways that this animal is affecting the Everglades habitat.

Elementary

Research Prompt:
You are assigned a report on the following: Citing specific evidence, in what ways has the invasion of the Burmese Python impacting the health of the Florida Everglades’ ecosystem?

Middle School

Research Prompt:
You are asked to create a public service message based on solid evidence, addressing the following: How are pythons impacting the biodiversity of the Everglades ecosystem?

High School
research prompts

**Community College**

**Research Prompt:**
You are beginning a literature search for your General Biology (BSC2005) final paper. You’ve decided to focus on the impact of the Burmese python (Python molurus bivittatus) to the biodiversity of the Florida Everglades.

**Undergraduate**

**Research Prompt:**
You are beginning a literature search for your Wildlife Issues final paper. You’ve decided to focus on the impact of the Burmese python (Python molurus bivittatus) to the biodiversity of the Florida Everglades.

**Graduate**

**Research Prompt:**
You are beginning a literature search for your Wildlife Issues final paper. You’ve decided to focus on the impact of the Burmese python (Python molurus bivittatus) to the biodiversity of the Florida Everglades.
THE STANDARDS • INSTRUCTION AND ASSESSMENT • PLANNING AND COMMUNICATION

MS. Interdependent Relationships in Ecosystems

Students who demonstrate understanding can:

MS-LS2-
2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. [Clarification Statement: Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.]  

MS-LS2-
5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services. [Clarification Statement: Examples of ecosystem services could include water purification, nutrient recycling, and prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations.]

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in 6-8 builds on K-5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.

- Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena. [MS-LS2-2]

Engaging in Argument from Evidence

Engaging in argument from evidence in 6-8 builds on K-5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world.

- Evaluate competing design solutions based on jointly developed and agreed-upon design criteria. [MS-LS2-5]

Disciplinary Core Ideas

LS2.A: Interdependent Relationships in Ecosystems

- Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interacting organisms with their environments, both living and nonliving, are shared. [MS-LS2-3]

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

- Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The complexity or integrity of an ecosystem's biodiversity is often used as a measure of its health. [MS-LS2-4]

LS4.D: Biodiversity and Humans

- Changes in biodiversity can influence human resources, such as food, energy, and fiber, as well as ecosystems services that humans rely on—for example, water purification and recycling. [secondary to MS-LS2-5]

ETS1.B: Developing Possible Solutions

- Are there systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem? [secondary to MS-LS2-5]

ETS2.D: Developing Solutions

- Are there systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem? [secondary to MS-LS2-5]

Crosscutting Concepts

Patterns

- Patterns can be used to identify cause and effect relationships. [MS-LS2-3]

Stability and Change

- Small changes in one part of a system might cause large changes in another part. [MS-LS2-3]

Connections to Engineering, Technology, and Applications of Science

Influence of Science, Engineering, and Technology on Society and the Natural World

- The use of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research, and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time. [MS-LS2-3]

Connections to Nature of Science

Science Addresses Questions About the Natural and Material World

- Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes. [MS-LS2-3]

Influence of Science, Engineering, and Technology on Society and the Natural World

- Science addresses questions about the natural and material world. [MS-LS2-3]

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Connections to Nature of Science

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seven common thread resources

BK06: The Effects of Burmese Pythons on Everglades Ecosystems

BK07: Invasive Pythons in the United States: Ecology of an Introduced Predator
https://books.google.com/books?id=6KkFcpAHGl8C&printsec=frontcover&s ource=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

BL04: Everglades Python Challenge: The Hunt for an Invasive Species
http://www.captainmitchs.com/airboat,tour,ride,evergladescity,captainmitc h,adventures,capt.fishing,fish/everglades-burmese-python/

JL06: Ecology: Snakes wipe out Everglades rabbits.
http://www.nature.com/nature/journal/v519/n7544/full/519393d.html

WE02: Burmese Pythons: Research
http://www.nps.gov/ever/learn/nature/burmesepythonresearch.htm

WE06: Burmese pythons in Florida
partnerships: instructional designer & programmer

Build Software:
Articulate’s Storyline 2

Data Extraction Software:
Uniform Server
Welcome
Self-reported instruments
Simulation
Data Cleaning & Quality Control
Codebook Creation
Takeaways
Q & A
@RSICStudy
# Quantitative Data Cleaning & Preparation

<table>
<thead>
<tr>
<th>Combining Raw Data</th>
<th>Creating Variables</th>
<th>Cleaning Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Combine survey and interview responses for each cohort</td>
<td>1. Facilitate combining cohorts</td>
<td>1. Correct inaccurate and incomplete cases</td>
</tr>
<tr>
<td>2. Combine all cohorts’ survey and interview data with all cohorts storyline data</td>
<td>2. Quantify open-ended text responses</td>
<td>2. Change cases to indicate that no response was given when appropriate</td>
</tr>
<tr>
<td></td>
<td>3. Replace facilitator text input with more accurate transcription of participants’ audio recorded responses</td>
<td>3. Remove redundancies</td>
</tr>
<tr>
<td></td>
<td>4. Capture additional information not included in raw data</td>
<td></td>
</tr>
</tbody>
</table>
qualitative data cleaning and preparation

1. Select a transcription service
2. Send audio for transcription
3. Review, clean, and scrub transcripts
Self-reported instruments
Simulation
Data Cleaning & Quality Control

Codebook Creation

Takeaways
Q & A

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what is coding?

“The goal of coding is ultimately data reduction...”

(Connaway & Radford, 2017, p. 299)
Initial Meeting

Clean-up

Trial Coding

Meeting to Approve New Codes

Review K12 Transcripts

Edit and Add Examples

Add Definitions and Examples

FtF Meeting

ICR
selecting transcripts

• 3 transcripts from each cohort
• Variety of session lengths
• Recommendations from facilitators
sources for themes and codes

- Transcript analysis
- Literature
- Data collection instruments
codebook structure

- Based on:
  - Patterns in identified themes
  - Research questions

- 3 Sections
  - Cues
  - Judgments
  - Personal Commentary
fun with coding
are these the same concept?

• “This is kind of like a counterargument of what I would say. So it's going to have both sides.” (U23 45:04)

• “So this is interesting because the title is actually suggesting that it is going to take a different viewpoint” (H2O 25:48)

• “I don't like Wikipedia because other people can give you different information and their opinion, so I don't use Wikipedia.” (E14 04:07)

• “TIME Magazine I'll just put somewhat credible because I'm sure there's some kind of bias involved in the magazine setting.” (G01 48:16)
How many themes are represented by the four excerpts?

1. 0 votes
2. 10 votes
3. 7 votes
4. 3 votes

20 votes - 20 participants
inter-coder reliability
TEAM BUILDING

Each person contributes in different ways. Invite people who know things you don’t know.
TIMING

Everything will take longer than you think.
Be generous with your planning.
RECRUITMENT

It's good to have a partner on the inside. You need someone to advocate for you.
COMMUNICATE

Think strategically about what tools you use to communicate across your team and with the AP.
FILE STORAGE

Plan your storage system early and stick to it. Your future self will thank you.
DATA MANAGEMENT
Your data is precious. Make plans to ensure that it stays safe.
PLAN FOR DATA SHARING & REUSE

Document everything that you are doing with your data and clean as you go. This makes it easier to share and reuse later.
Self-reported instruments

Simulation

Data Cleaning & Quality Control

Codebook Creation

Takeaways

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We Made It!

Questions?