Designing a “Point of Selection” Study Using Simulations: From Trailhead to Terminus

LG-81-15-0155
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

Total votes: 58 - Total participants: 22
presenters:

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- Brittany Brannon (OCLC Research – Research Support Specialist) brannonb@oclc.org
our early trekkers
important links:

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

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

@RSICStudy
introduction: basecamp
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
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
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
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
floridamuseum • Follow
Florida Museum of Natural History

floridamuseum This week we are looking at invasive species in #florida for #nisaw Herpetologist Kenny Krysko displays the tanned skins of two Burmese pythons captured in Everglades National Park and necropsied at the Florida Museum. Krysko is standing on the walkway between Dickinson Hall and Bertram Hall @uforida. The larger snake measured 17 feet 7 inches and contained 87 eggs, both state records in 2012, when the snakes were collected, while the smaller snake measured 16 feet 6 inches. According to @usgs tens of thousands of invasive Burmese pythons are estimated to be present in the Everglades. #floridamuseum #invasion #burmese #python #herpetology #snakes @evergladesnps

bannanahumin @hint77

367 likes
FEBRUARY 25

Log in to like or comment.
why a python?

- 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 prompts

**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.

**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?

**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?
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.
MS. Interdependent Relationships in Ecosystems

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 relationship among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.] 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
Conducting Experiments and Designing Solutions
Constructing explanations and designing solutions in K-8 builds on K-5 experiences and progresses to including 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 K-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 between organisms with their environments, both living and nonliving, are shared. (MS-LS2-2)

LS2.C: Ecosystem Dynamics, Functioning, and Resilience
Biodiversity describes the variety of species found in Earth’s terrestrial and aquatic ecosystems. The completeness or integrity of an ecosystem’s biodiversity is often used as a measure of the ecosystem’s health. (MS-LS2-5)

LS4.D: Biodiversity and Humans
Changes in biodiversity can influence human resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. (secondary to MS-LS2-5)

ETS1.B: Developing Possible Solutions
There are 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)
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Stability and Change
- Small changes in one part of a system might cause large changes in another part. (MS-LS2-3)
- Small changes in one part of a system might cause large changes in another part. (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 makes. (MS-LS2-3)

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Connections to Other Disciplines

1. HS-LS2-7 Ecosystems: Interactions, Energy, and Dynamics
   - includes urbanization, building dams, and dissemination of invasive species. The performance expectation above was...

2. HS. Interdependent Relationships in Ecosystems
   - includes urbanization, building dams, and dissemination of invasive species. HS-LS2-8. Evaluate evidence for the role of...

3. HS-LS2 Ecosystems: Interactions, Energy, and Dynamics
   - includes urbanization, building dams, and dissemination of invasive species. HS-LS2-8. Evaluate evidence for the role of...

4. HS-LS4 Biological Evolution: Unity and Diversity
   - results from four factors: (1) the potential for a species to increase in number, (2) the inheritable genetic variation of...habitat destruction, pollution, introduction of invasive species, and climate change. Thus sustaining biodiversity so that...habitat destruction, pollution, introduction of invasive species, and climate change. Thus sustaining biodiversity so that...

5. HS-LS4-6 Biological Evolution: Unity and Diversity
   - for a proposed problem related to threatened or endangered species, or to genetic variation of organisms for multiple species. Habitat destruction, pollution, introduction of invasive species, and climate change. Thus sustaining biodiversity so that...

6. MS-LS2-5 Ecosystems: Interactions, Energy, and Dynamics
   - design solutions for maintaining biodiversity and ecosystem services. (Clarification Statement: Examples of ecosystem...as a measure of its health. LS4.D: Biodiversity and Humans Changes in biodiversity can influence humans’ resources, such as...

7. HS-LS2-7 Ecosystems: Interactions, Energy, and Dynamics
   - Design core ideas: LS2.C: Ecosystem Dynamics, Functioning, and Resilience Moreover, some species. LS4.D: Biodiversity and Humans Biodiversity is increased by the formation of new...

8. MS. Interdependent Relationships in Ecosystems
   - design solutions for maintaining biodiversity and ecosystem services. (Clarification Statement: Examples of ecosystem...on its health. (MS-LS2-5): LS4.D: Biodiversity and Humans Changes in biodiversity can influence humans’ resources, such as...

9. 3-LS4-4 Biological Evolution: Unity and Diversity
   - problem. Design core ideas: LS2.C: Ecosystem Dynamics, Functioning, and Resilience When the environment...some die. (secondary): LS4.D: Biodiversity and Humans Populations live in a variety of habitats, and change in those...

10. MS-LS2 Ecosystems: Interactions, Energy, and Dynamics
    - availability on organisms and populations of organisms in an ecosystem. (Clarification Statement: Emphasis is on cause and effect...of its health. (MS-LS2-5): LS4.D: Biodiversity and Humans Changes in biodiversity can influence humans’ resources, such as...

11. HS. Interdependent Relationships in Ecosystems
    - conditions, but changing conditions may result in a new ecosystem. (Clarification Statement: Examples of changes in ecosystem...some species. (HS-LS2-6): LS4.D: Biodiversity and Humans Biodiversity is increased by the formation of new species...

12. HS-LS2 Ecosystems: Interactions, Energy, and Dynamics
    - of matter and flow of energy among organisms in an ecosystem. (Clarification Statement: Emphasis is on using a mathematical...relatives. (HS-LS2-6): LS4.D: Biodiversity and Humans Biodiversity is increased by the formation of new species...
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=6KkFcpAHG18C&printsec=frontcover&source=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,captainmitch,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

**WE01: Everglades Under Attack. A Burmese Python Invasion.**
http://pythonpatrol.weebly.com/

**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
## 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
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

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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
2. 10
3. 7
4. 3

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.
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.
We Made It!

Questions?