Study #1: Student Skills Test and Survey

Three principles:
1. Multiple means of engagement
2. Accessibility:
   - Reduce questions
   - Tutorial
3. Help when there is a problem

Topics Covered:
- Cartoons
- Shareable by others
- Comics
- Animation
- Audio recordings
- Universal Design for Learning, the Library, and STEM:
  - Reduce text to only necessary concepts.
  - Instruction, not just those with disabilities.
  - All students can benefit from differentiated instruction.
  - Library session

Assignments:
- Undergraduate Biology Courses BIOL 1051 & 1101
  - Two similar assignments.
  - Students are required to find research articles in a database.
  - Distinction.
  - Assignments are either a lab report or oral presentation.

Objectives:
- Students will successfully locate information in the database.
- Students will be able to distinguish between primary and secondary sources.
- Students will apply UDL principles to their learning.

Technology Used:
- LibGuides
- Vegas
- Sound Forge
- Camtasia
- ToonDoo

Development:
- Introduction and Instructional Design Libraries
- Feedback from Biology Instructors
- ASSISTive Technology Standards for STEM

Tutoring “Tutorial Feel”

Navigation:
- Hotspot
- Button

Performance Metrics:
- Hypothesis
- Aims: Test usability, UDL principles

Research Questions:
1. Does the biology tutorial successfully instruct students on finding primary vs. secondary sources for their biology coursework?
2. To test the use of Universal Design for Learning (UDL) principles in the tutorial for undergraduate students in BIOL 1051/1101.

Data Collection:
- Data collected via short presentation by Science Librarian, email recruitment, and Qualtrics.
- Testing to occur in Summer and Fall 2013 semesters.

Recruitment:
- Via email

Validity and Reliability:
- Time spent on tutorial.
- Tutorial effectiveness.
- Acronyms and symbols.

Research Questions:
- In what order did you try to complete the library portion of the assignment? (Ordering)
- What was the first thing you noticed about the page? (Hotspot)
- What is Colony Collapse Disorder and what are the causes of decline in bee populations in the US? (Multiple choice)
- What would be a good keyword search to find articles about this research question? (Multiple choice)
- While using the tutorial, were you ever confused or unable to find information? (Multiple choice)
- Which method do you believe would help you best learn to use the library for Biology? (Multiple choice)
- What type of learner do you tend to be? Auditory | Visual | Kinesthetic | I don’t know
- How much time did you spend on the tutorial? (Numerical)
- Grade the tutorial for effectiveness (Grade A-F)
- What type of learner do you tend to be? Auditory | Visual | Kinesthetic | I don’t know
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Data Analysis:
- Hypothesis
- Aims: Test usability, UDL principles

Hypothesis Testing:
- The UDL principles will allow students with different learning styles and disabilities to successfully locate information in the database.
- The UDL principles will help students with ADHD and visual learners.
- The UDL principles will help students who are kinesthetic learners create interactive tutorials with user motion.
- The UDL principles will help students who are auditory learners create audio files for important concepts.
- The UDL principles will help students who are visual learners create comics.
- The UDL principles will help students who are kinesthetic learners create animation.

Institutional Review Board: Certified Exempt

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- No financial conflicts of interest.
- The research was not supported by any grants.

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Conflict of Interest:
- The authors declare no conflict of interest.

Ethical Approval:
- The study was approved by the Institutional Review Board.
- The study was conducted in accordance with the Declaration of Helsinki.

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References:
- College and Research Libraries, 68. doi:10.5062/F46H4FBH
- College and Research Libraries, 68. doi:10.5062/F46H4FBH
- Science and Technology Libraries, 27(4), 19-42.
- Science and Technology Libraries, 27(4), 19-42.