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# SWIM RELAY: USING A MEDLEY OF TECHNIQUES TO TEACH INFO LIT CONCEPTS & MECHANICS

SAMANTHA HARLOW AND MAGGIE MURPHY

## INTRODUCTION

Over two decades ago, Gibson (1995) argued that library instruction must focus on concepts over mechanics in order to help students develop the mental models they need to engage in critical thinking about information, particularly in one-shot sessions. However, while many teaching librarians today strive to address conceptual aspects of information literacy in one-shots, disciplinary faculty and students still expect that we will demonstrate some research mechanics, such as how to use specific tools like databases and citation management platforms. It can be difficult to do both! Luckily, information literacy instruction is a team sport, and like members of a swim team competing in a medley relay race, individual librarians often have functional expertise with different techniques or styles that can help the whole team go the distance. To address this, two librarians from UNC Greensboro with different areas of functional expertise developed a 50-minute workshop, “Swim Relay: Using a Medley of Techniques to Teach Info Lit Concepts & Mechanics,” to focus on a complementary set of strategies that can help students develop mental models of the information environment: concept-based online tutorials and analogy-based demonstration of research mechanics.

## LITERATURE REVIEW

The amount of time librarians have to address deeper information literacy concepts in face-to-face one-shot instruction sessions is often limited, since faculty sometimes expect that a librarian will spend the class session demonstrating specific tools and search tasks related to a research assignment (Scott, 2016). Yet, one-shots focused on database demonstrations rarely have a meaningful impact on students’ development of information literacy dispositions and practices (Howard, Nicholas, Hayes, & Appelt, 2014). Rightful criticism of point-and-click demonstrations during one-shot instruction sessions emphasizes the futility of teaching specific tasks and tools when students do not understand the complex processes that determine how information is created, shared, and valued in society. Writing about the relationship between critical thinking and research competencies, Gibson (1995) points out that students lack “sound mental models” of databases and other research tools, which leads to incorrect assumptions about how to use the tools effectively; this cannot easily be rectified through demonstration of search tasks.

However, since “learners’ models of a domain are shaped by such instructional analogies” (Gentner & Forbus, 1996), making analogies between these tasks and tools to the processes and technologies students already know helps students more quickly understand the logic behind how they work, and thus how to use them. At the same time, concept-based online tutorials have been shown to positively impact students’ understanding of foundational information literacy concepts, especially when they are grounded in disciplinary applications and offered at the point of need (Tancheva, 2003). In fact, concept-based tutorials and analogy-based instruction are both grounded in a simple principle articulated by Dewald (1999): “when students understand why something is done, they are more likely to remember it and to be able to apply the concept in a new context” (p. 30). In other words, developing online tutorials to teach concepts asynchronously and using analogies to explain mechanics in face-to-face instruction helps give students the frames of reference they need to understand and apply the abstract ideas and concrete tasks that underlie information literacy practices, while also maximizing time for active learning in synchronous, flipped, and face-to-face instruction.

## WORKSHOP SUMMARY

Our workshop introduced two complementary techniques for library instruction that encourage mental modeling so that students can grasp complex processes and concepts more easily: analogies for mechanic-based tasks in face-to-face instruction and concept-based tutorials for online instruction. We briefly went over the theories and principles behind these pedagogical strategies for teaching information literacy skills and habits of mind before moving on to give time for participants to engage in and share experiences with the active instructional design and teaching techniques we use to plan and implement these strategies, such as storyboarding, analogy mapping, card sorting, and narrative storytelling. After handing out two different worksheets that we had designed for the workshop and have made available for reuse through a Creative Commons CC-by-NC-SA license, we asked participants to work in small groups to experiment with the worksheets and discuss how they might adapt these strategies and techniques at their own institutions. Finally, during the question and answer session, participants offered ideas for analogies that they had brainstormed in their small groups and from their own teaching experiences.

### Analogy-Based Instruction

Analogies have long been used for science instruction because they are an effective tool for helping students understand new ideas and complicated processes. While the research process might seem much more straightforward than the Higgs boson at first glance, we know it is actually complex and iterative—and faculty can wrongly assume that students already understand foundational concepts about scholarly conversations, information creation processes, and ethical use of information implicitly embedded in their research assignments (Howard & Jamieson, 2014; Leckie, 1996). Therefore, conversations about the importance of concept-based information literacy instruction, even in one-shot sessions, have persisted for years. Many disciplinary faculty still hold the expectation that their students only need to see specific tools and tasks demonstrated by a librarian to become successful researchers. It is difficult for instruction librarians to address both concepts and mechanics adequately in a one-shot session, especially in a way that encourages students to engage in active learning.

Using analogies while demonstrating search mechanics to students is an efficient way for librarians to quickly guide students through the use of specific tools because students do not have to start from scratch for their mental models of how these tools work if an analogy can be drawn between that tool and something familiar to the student. For example, a student who understands that Hulu, Amazon Prime, Netflix, and HBO Go are competing platforms for streaming television shows and movies will more quickly grasp why the library subscribes to so many different databases and why it might be a good idea to search for articles in multiple databases in order to answer a research question. Furthermore, teaching with analogies can also be part of an asset-based pedagogy, because it builds on what students already know about the world instead of assuming a deficit in their knowledge.

### Figure 1: An example of a library instruction analogy mapping

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### Concept-Based Tutorials

University and college students need to understand the mechanics of research, but they also need to connect to information literacy concepts. Conceptual learning is “an educational method that centers on big picture” and “focuses on understanding broader principles of ideas (what we call concepts) that can later be applied to a variety of specific examples” (Elsevier Evolve, 2019). In a world where library interfaces (such as databases) change often, creating more concept-based tutorials instead of resource focused online tutorials can help reduce the frequency with which librarians need to update their online learning objects. When there is limited time in face-to-face library instruction, it can be useful to flip the classroom using online learning objects on research and information literacy concepts. Lastly, learners are shifting in higher education, with more non-traditional, adult, and distance students enrolled at colleges and universities. These learners need online learning objects and tutorials to help understand the mechanics of how to use library resources, as well as to see the larger picture of research.

When thinking about the concepts of information literacy for academic libraries, it’s useful to reference the Association of College & Research Libraries (ACRL) *Framework for Information Literacy for Higher Education* (2015) because of its focus on the conceptual aspects of information literacy. For example, there are numerous references to concepts and conceptual understanding in the introduction to the document (emphasis is added):

The *Framework* offered here is called a framework intentionally because it is based on a **cluster of interconnected core concepts**, with flexible options for implementation, rather than on a set of standards or learning outcomes, or any prescriptive enumeration of skills. At the heart of this *Framework* are **conceptual understandings** that organize many other **concepts** and ideas about information, research, and scholarship into a coherent whole . . . The *Framework* is organized into six frames, each consisting of a **concept central to information literacy, a set of knowledge practices, and a set of dispositions**.

Likewise, instructional design frameworks and philosophies often cite the importance of background information or concepts. The principles of instructional design theories and models can help librarians create conceptual e-learning objects about library services through helping librarians know their intended audience. For example, Universal Design for Learning (UDL) is about creating accessible learning experiences for all learners, and it stresses the importance of multiple means of engagement, representation, and action or expression (Gordon, Meyer, & Rose, 2016). This means that UDL helps designers create accessible online learning objects, but also calls for creators to produce diverse concept driven online learning objects to meet different learning preferences. In the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) instructional design model, the first step—analyze—includes thinking about instructional goals, target audience characteristics, and required resources (Branch, 2009). Finally, Design Thinking is an iterative process asking designers to solve problems and plan projects around: empathize, define, ideate, prototype, and test. Design Thinking first asks the designer to focus on empathy, in order to develop concept stories to connect to the intended audience (Curedale, 2013).

**Table 1: Suggestions of free and paid for tools for designing concept-based online learning objects for information literacy instruction.**

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### Interactive Small Group Work

While there are many ways for librarians to engage with analogy-based mechanics instruction and concept-based online tutorials, we wanted to share our processes for designing and implementing teaching analogies and tutorials at UNC Greensboro and give participants something tangible to take home. Therefore, we created step-by-step planning worksheets for mapping analogies and storyboarding tutorials (see Appendix) and asked participants to work in small groups to experiment with the worksheets, discuss their experiences with using analogies and creating online tutorials, and identify ways in which these strategies could be used or adapted at their own institutions. Additionally, using worksheets for these design processes in our day-to-day work allows both us and the workshop participants to more easily visualize ideas and seek peer and student feedback. Machine-readable PDF versions of both worksheets are available at <http://go.uncg.edu/swimrelay>.

As we distributed the planning worksheets, we shared some of our best practices for analogy mapping and storyboarding as instructional design strategies. For example, one of the most important things to keep in mind for teaching with analogies is to remember that teaching analogies are enhanced by verbal and visual elaboration. While the analogy mapping worksheet from our workshop includes directions for engaging in storytelling, we also recommended the practice of visually demonstrating to students how concepts map to each other with a live demonstration, graphic representation, or simple whiteboard drawing. Additionally, while there are many ways to approach storyboarding, we recommended that participants begin the process by empathizing with students and acknowledging challenges they face that could be alleviated by developing conceptual understandings about information and research.

**Figure 2: Example of a storyboarding process grounded by empathy**

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Finally, we asked for participants to share out what they had discussed in their small groups at the end of the workshop. Because creativity doesn't always happen on cue, we did not expect that participants would walk away with fully planned tutorials or completed lesson plans for analogy-based instruction. Rather, the value of the workshop was intended to be the connections participants made with each other over conversations about these techniques and how they might be useful to their own teaching processes and contexts.

### CONCLUSION

The "Swim Relay" workshop was intended to introduce both techniques and their practical benefits for instruction librarians and students using examples from our own work and other libraries. For example, concept-based online tutorials and analogy-based demonstration of research mechanics can be used together to help address the limitations of one-shot instruction sessions using a flipped-classroom model, as well as used separately in a range of instructional scenarios or environments. If we have another opportunity to teach this workshop in a more extended form, we would also like to include opportunities for hands-on practice with incorporating visual elements into analogy-based instruction, using card sorting for arranging elements of lesson plans, tutorials, or broader information literacy curricula, and rapid prototyping.

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# Analogy



## Brainstorming

1. What are you trying to explain? (This is your "target.")
2. Why is this concept or process "a stumbling block" for students?
3. Break down this concept into bullet points of major features or tasks (think physical *and* metacognitive!)
4. What familiar concept has similar features or tasks? (This is your "analog.") Your analogy might combine more than one analog to address all of the target features! Draw lines between the target and analog features that map to each other.

Target:

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- 
- 
- 

Analog:

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- 
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- 
- 
- 

Analog:

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5. Write out your analogy in narrative form. Explain the analogy. What is the relationship between the target and analog? Compare and contrast!

*Imagine that...*  
*You know how...*  
*Does anyone do/use/have...*  
*It's kind of like the way...*

Created by  
Maggie Murphy at  
UNC Greensboro





# Concept Storyboarding

1. What is a challenge that students face in the research process?
2. What conceptual understanding do students need to overcome that challenge?

3. What are some services and/or resources that your library can provide to help with this concept?

4. What do you want the student to learn (learning objectives) and what *Frame* does it relate to? Which tutorial formats (such as video, infographic, interactive module) would be most effective for meeting your LOs?

Library Services:

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Learning objectives & Framework:

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- 

Tutorial formats:

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5. Write out a story for a library tutorial in detail. Explain the value of the research concept through a student's point of view.

*Janice is having trouble finding articles to support their thesis ... chatting with a librarian about developing research questions*

Created by Sam Harlow & Maggie Murphy at UNC Greensboro



**Images for Tables and Figures (Editor will put in body of the text later)**

**Table 1**

<p align="center"><b>Video</b>  <a href="#">NC State: Picking your Topic IS Research!</a></p>	Powtoons	Google Slides/ SlideCarnival	Camtasia	ScreenCast-O-Matic
<p align="center"><b>Infographic</b>  <a href="#">Duke University Information Privilege Backpack</a></p>	Canva	Ease.ly, Piktochart, Visme	Google Slides	PowerPoint
<p align="center"><b>Tutorials</b>  <a href="#">KState University New Literacies Alliance, Scholarship is Like a Conversation</a></p>	H5P	SoftChalk, Articulate, Storyline	Camtasia	Learning Management System (LMS)
<p align="center"><b>Graphic Design</b></p>	<p><b>Icons:</b> Iconfinder, Noun Project, Flaticon</p>	<p><b>Tutorials:</b> Tutpad, Tutplus</p>	<p><b>Colors and fonts:</b> FontSquirrel, DaFont, ColorPick Eyedropper Chrome extension</p>	Instructional Design Frameworks/ Processes (ADDIE, etc)



Figure 1

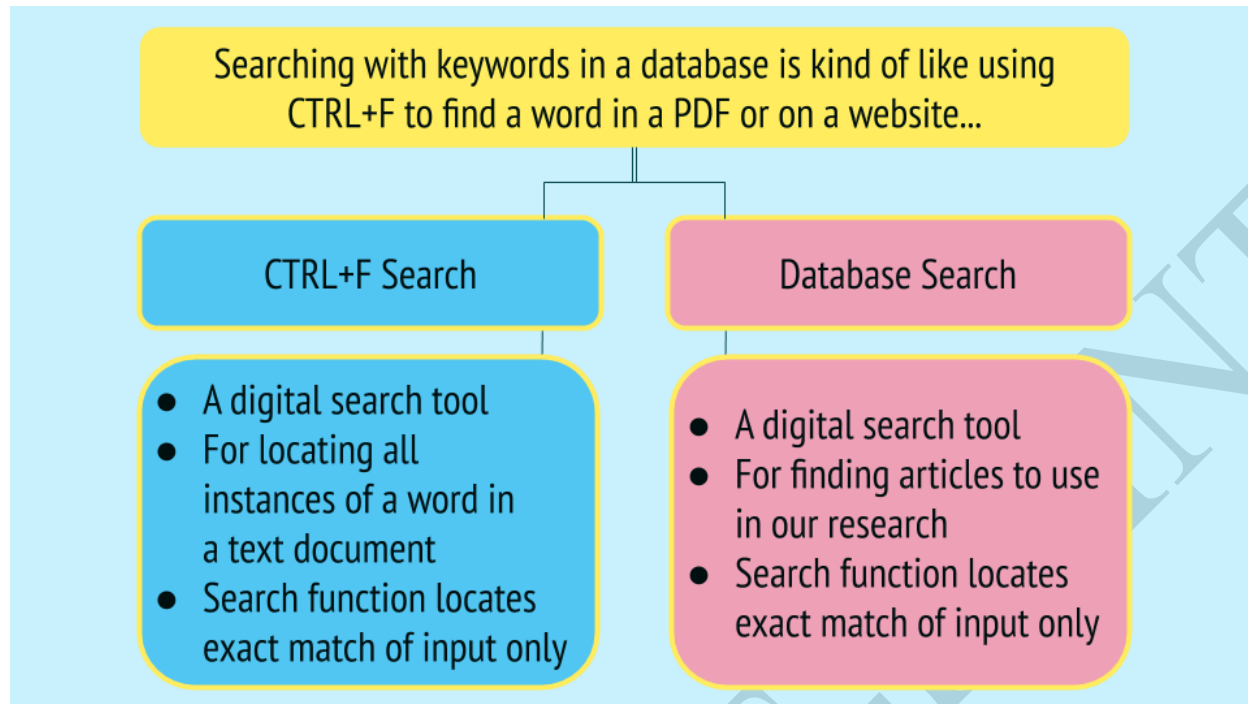


Figure 2

