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Monograph title: *Envisioning the Framework: A Graphic Guide to Information Literacy*

Editor: Jannette L. Finch

Review close: Monday, July 13, 2020

Google document available at: https://docs.google.com/document/d/1KJmun8UqMyirsyeKK0Lx-ZwBJLU9grYaEU0-zRwqBw/edit?usp=sharing

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Envisioning the Framework:

A Graphic Guide to Information Literacy

Jannette L. Finch, Editor
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FOREWORD

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Envisioning Information

In 1990, Edward R. Tufte published the first edition of *Envisioning Information*,¹ a book that showcases design excellence for charts, maps, computer interfaces, exhibits, and other important means of information exploration and communication.

*Envisioning the Framework: A Graphic Guide to Information Literacy*—published thirty years later—offers a visual introduction to *The Framework for Information Literacy for Higher Education* for librarians, designers, and others. The Framework aims to empower anyone to extract information from data so it can be converted into knowledge and wisdom for the benefit and enjoyment of all. If you are interested to become an effective information explorer, navigator, manager, or communicator, this book is for you.

Defining and Measuring Information Literacy

There exist many definitions of information literacy, data literacy, and data visualization literacy² and they are often used interchangeably. In general, it is assumed that the ability to read, make, and explain data via visual depiction of information requires three general types of literacy: (1) Textual literacy—the ability to read and write text in titles, axis labels, legends, (2) Visual literacy—the ability to find, interpret, evaluate, use, and create images and visual media, and (3) Mathematical literacy—the ability to formulate, employ, and interpret math in a variety of contexts. Fortunately, there exist standardized tests for all three of these types of literacy. The tests are administered regularly to understand and compare current literacy levels and to improve the effectiveness of different engagement and teaching strategies. Many of the existing tests do not just focus on reading and recall; they aim to measure writing and production of text, images, or data visualizations.
Most information literacy frameworks build on and consolidate prior work in library science, cartography, psychology, cognitive science, statistics, scientific visualization, data visualization, learning sciences, etc. in support of a de facto standard. Many frameworks take human perception and cognition into account. Almost all frameworks aim to be theoretically grounded, practically useful, and easy to learn and use. Frameworks must be used in different applications, tested rigorously, and optimized. Ideally, frameworks are modular and extendable so new data, methods, and tools can be incorporated.

### Enjoying and Acquiring Information Literacy

Given an information literacy framework, it can be used to systematically construct information descriptions or visualizations. For example, the *Places & Spaces: Mapping Science* exhibit features 100 large-format maps and 20 interactive data visualizations that exhibit visitors can explore, enjoy, and play with, see [http://scimaps.org](http://scimaps.org) and Figure 1.

![Figure 1: Mapping Science exhibit at Duke University (left) and The Immersion Theater, Hunt Library, North Carolina State University (right)](https://cns.iu.edu/all_news/event/ncstate.html)

Among others, there are maps that communicate *The History of Science* using ebook data from Project Gutenberg ([http://www.gutenberg.org](http://www.gutenberg.org)), maps that introduce organizational structures such as the MACE Classification Taxonomy developed within the European MACE project see Figure 2, left, but also maps that depict Literary Empires: Mapping Temporal and Spatial Settings of Victorian Poetry see Figure 2, right.
In addition, there are courses that empower many to improve their literacy via practical hands-on material and case studies. Almost every institution of higher education now offers data visualization, information visualization, or information literacy classes taught by faculty and/or librarians. Many courses are available online and are taught as Massive Open Online Courses (MOOC) scaling to 1000s of students. In January 2020, 226 ‘visualization’ courses are listed on https://www.classcentral.com.

Most courses target students and require 8-15 weeks of substantial effort to complete. However, there is a growing number of courses that are designed for the working professional. One example is the Visual Analytics Certificate (https://visanalytics.cns.iu.edu) that introduces data-driven decision making, a data visualization framework, and general data analysis and visualization workflow design in 30 hours of concentrated work over six weeks. Students learn how to answer “When” (Temporal Data Analysis and Visualization), “Where” (Geospatial Data Analysis and Visualization), “What” (Topical Data Analysis and Visualization), and “With Whom” (Network Analysis and Visualization) questions. The course concludes with information on likely future developments and value creation via data-driven decision making. Students apply new knowledge and skills in personally relevant projects that require identifying user needs and priorities; selecting the best data, algorithms, and workflows for temporal, geospatial, topical, and network case studies; communicating actionable insights using standard terminology; and gaining efficiencies for delivering high-quality results on time and on budget.

Figure 2: MACE Classification Taxonomy by Moritz Stefaner (top) and Literary Empires by Walsh et al. (bottom)
Data is valuable. Information, knowledge, and wisdom extracted from data are invaluable. However, only good data—mined and interpreted correctly—supports good decisions. Hence, it is of utmost importance to capture highest quality data; to manage, analyze and visualize it correctly; and to use it effectively to inform personal and professional decision making. Librarians, teachers, and others aim to meet the data and information needs of millions. They teach billions how to find and utilize relevant information and expertise. They invent new means to use machine intelligence to support navigation and exploration of a digital universe that will reach 44 zettabytes by 2020. Last but not least, they promote visual literacy and utilize data visualizations to create a highly effective interface between what computers and algorithms do best (e.g., storage, computation) and uniquely human capabilities (e.g., pattern recognition, creative problem solving). This book tries to explain how visual literacy and data visualizations are defined, developed, implemented, and taught.

Notes


Bibliography


Walsh, John A., David Becker, Bradford Demarest, Theodora Michaelidou, Laura Pence, and Jonathan Tweedy. “Literary Empires: Mapping Temporal and Spatial Settings of Victorian Poetry.” Courtesy of Indiana University, with content provided by the David Rumsey Historical
Biography

KATY BÖRNER is the Victor H. Yngve Distinguished Professor of Engineering and Information Science in the Departments of Intelligent Systems Engineering and Information Science, Luddy School of Informatics, Computing, and Engineering; core faculty of the Cognitive Science Program; and founding director of the Cyberinfrastructure for Network Science Center (http://cns.iu.edu)—all at Indiana University in Bloomington, Indiana.

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Börner’s research focuses on the development of data analysis and visualization techniques for information access, understanding, and management. She is particularly interested in the formalization, measurement, and systematic improvement of people’s data visualization literacy; the study of the structure and evolution of scientific disciplines; the analysis and visualization of online activity; and the development of cyberinfrastructures for large-scale scientific collaboration and computation.

She holds an MS in electrical engineering from the University of Technology in Leipzig and a PhD in computer science from the University of Kaiserslautern.
INTRODUCTION

Making the Case:
The Value of Visualizing the Frames and Framework

Jannette L. Finch

The Background

The Framework for Information Literacy for Higher Education (Framework) adopted in 2016 by the Association of College and Research Libraries (ACRL) was developed with broad community involvement over a three-year period. The Framework presents threshold concepts or core ideas in information literacy. The six frames described in the Framework are typically listed in alphabetical order as they are not hierarchical. The frames, or core ideas, are: Authority Is Constructed and Contextual, Information Creation as a Process, Information Has Value, Research as Inquiry, Scholarship as Conversation, and Searching as Strategic Exploration. Each frame’s characteristics are described in separate sections and include the knowledge practices and dispositions of learners as they engage with the frame.

Using the Framework to guide information literacy efforts has not been without controversy. Attitudes of academic librarians toward the Framework have been captured in surveys, in research papers, in listservs, opinion papers, and lively staff meetings. The reasons expressed for any difficulty in applying the frames to information literacy teaching and learning vary. Much of the controversy is captured in Reed’s article, “It Takes a Community.” A theoretical document that contains no direct, practical application, the Framework presents a challenge to implement, especially in the one-shot session common in information literacy instruction that is often 50 minutes or less. Reed describes the Task Force responsible for the Framework as acknowledging that the Framework is not to be implemented in a single information literacy session, but developmentally and systematically integrated into a student’s academic program.
In another article, Rinne plunges into a deep discussion on truth, specifically as it relates to the frame Authority is Constructed and Contextual. Rinne questions whether the Framework falls short in providing a deep understanding of information and knowledge. Rinne describes the current educational environment as emphasizing self-discovery and real-life job training and advocates for guiding students to information, and more importantly, to real knowledge.7

Information literacy has markedly shifted in the past few decades from a functional skill set toward a “social achievement” marked by access to digital tools and new media, as noted by Towndrow, Nelson, and Yusef.8 21st-century information literacy involves the metaliterate learner described by Mackey and Jacobson,9 reflects seismic changes in the duties and roles of teaching librarians,10 requires new partnerships with faculty and instructional designers, and emphasizes continuous assessment practices. In a changing environment, the Framework was developed intentionally without prescriptive lists of skills and with flexible options for implementation. Although adoption and application of the frames might be challenging, understanding the Framework and communicating the frames coherently is absolutely necessary to:

- communicate with peers, students, and administration;
- share with faculty and get faculty buy-in;
- design and assess learning experiences;
- align with student learning outcomes;
- comprehend the difficulty of covering all six frames in typical one shot sessions;
- change from standards (skills) to frames (theoretical).

The Framework was informed by threshold concepts, using the metaphor of the passageway or portal.11 A deep dive into threshold concepts is found in a foundational article for the Framework, “Identifying Threshold Concepts for Information Literacy.”12 Moving from old meanings of information literacy to new understandings is transformative,13 and cannot happen without a certain amount of adjustment, or even pain. Westley and Folke suggest that “consistent with the Jungian notion of the collective conscious/chaos theory, transformation, whether cultural, ecological, or individual, involves a process of descending into confusion, chaos, or disorder.”14 The frustration many feel with understanding and implementing the Framework may be a normal and even necessary part of the transformative process. Land, Rattray, and Vivian describe threshold concepts as new learning which “can act in the manner of a portal, or learning threshold, through which a new perspective opens up for the learner.” They state, “threshold, portal, gateway, doorway are all metaphors that have been used for describing the nature of transformative concepts in the thresholds literature.”15
Some novel approaches to understanding the Framework have been proposed using methods more common to other disciplines. Vossler and Watts suggest treating the Framework as an educational story, a pedagogical technique used in higher education to teach both practical and theoretical outcomes. Miller describes reflecting on the Framework through a “Decoding the Disciplines” approach. Holliday uses metaphor as a device for deeper understanding for students, librarians and academics. Harden advocates for “probabilistic topic modeling” to gauge student understanding.¹⁶

**Chaos into Order: Sense-Making, Visualizations, and Semiotics**

In seeking clarity and understanding of the Framework and the frames, the authors represented in *Envisioning the Framework* have used the power of visual representation. Visualizations and symbols offer an attractive “means of organization…the scientist or artist returns to an iconic image in an effort to make sense of data, as a touch point for new explorations.”¹⁷

Visualizations supporting information literacy are an important, emergent area. The following examples represent efforts to illustrate elements of 21st-century information literacy. In 2005, Mackey and Ho described a convergent model to link web literacy and research literacy within an information literacy framework. This work recognizes students as authors and producers and represents related concepts in a Z-pattern.¹⁸

Mackey and Jacobson developed a concentric circle metaliteracy model in 2011, recognizing information sources such as Open Education Resources and social media. They included the ACRL standards set in 2009 and placed learners as producers and collaborators. The circular design emphasized the non-linear, flexible, and individualized nature of metaliteracy.¹⁹

In 2014, Mackey and Jacobson placed the metaliterate learner at the core of a circular framework divided into four domains: metacognitive, cognitive, behavioral, and affective. Once again, the model emphasized fluidity and interrelatedness. As Mackey and Jacobson continue to present in conferences and as keynote speakers, they have created graphical representations of aspects of
the 2016 Framework. In their chapter within Envisioning the Framework, Jacobson, Mackey, and O’Brien represent the convergence of metaliteracy and the Framework in a visualization that is both clarifying and beautiful.

A Google image search reveals more efforts to visualize the Framework, including a visually appealing oval design by Burress. Also easily found is an inceptive effort to depict the frames by Bucknell University’s Bertrand Library Research Services in the form of freely available downloadable posters. In these visuals, the frames are displayed in organizational chart layout and include blocks of questions meant to introduce the frames to students and inspire questions.

Tysick created an elegant set of bookmarks to visually represent each of the Frames. Her version provides a concrete definition for each frame and lists practices that facilitate understanding.

Ziegler expresses connecting the six frames with digital badges to be used in online instructions efforts. In Ziegler’s description of the brainstorming process librarians used to generate types and names of badge structures, she mentions developing lists of topics, outcomes, and skills. The skills the librarians agreed upon were aligned with the six frames. Recognizing that the work of librarians covers many areas outside of typical information literacy, Ziegler’s working team added three more badge areas in addition to the six frames.

Exploring the Framework visually offers an opportunity for thought, discovery, and sense-making. Although cultural differences may make depicting the Framework as iconic symbol problematic, it is a worthy endeavor. All cultures share the culture of being humans and the need to communicate. We are not only homo sapiens, but also homo significans, or meaning-makers, as described by Daniel Chandler. Using visuals for sense-making is central in the field of semiotics. In its simplest definition, semiotics can be the study of signs, but that is deceptively simple. The field of semiotics is forested with “many different branches,” examining definitions of signs, intended meanings of signs, and the interpretations that viewers construct when seeing signs. Semiotics offers a rich canvas of widely divergent definition, traditions, and arguments in the fields of education, philosophy, design, information technology, psychology, sciences, theology, and more. Semiotics stems from two main traditions: Swiss linguist Ferdinand de Saussure (1857-1913) and North American philosopher Charles Sanders Peirce (1839-1914), pronounced purse. Semiotics is a useful lens to apply to understanding any abstract idea, “entities that are not visible” and for describing “people as they cross knowledge boundaries.” In library research, Wells describes semiotics as mostly connected with knowledge organization. Wells describes the subfield of social semiotics and advocates for including it into the “toolkit” of library and information science. In social semiotics, text, images, sounds and more are part of a whole, multimodal, meaning-making system.
Sign, Signs

The following is given with apologies to Peirce scholars for any misinterpretations or gross oversimplification. In the Peircean tradition of semiotics, a sign only gains meaning when it is invested with meaning and meaning is achieved in a triadic relationship. The triadic model seen in figure 2 is the representamen (the form the sign takes), an interpretant (the sense made of the sign), and an object (to which the sign refers).  

![Figure 2: Peirce’s triadic sign relation. Reused with permission of Michael H.G. Hoffman](image)

The sign is not necessarily a physical or mental thing; it is a function or role and contributes to a change in understanding. Peirce further separated the idea of sign into symbol (there is no causal link, but an association is made through custom, culture, tradition, law, rule, or norm, as in the female symbol stands for a woman), icon (stands for something by resembling it or being similar to it, as in a photograph of a dog looks like a drawing of a dog), and index (there is a causal link between sign and object, as in smoke is an index of fire). For the purposes of this chapter, we will think of the visuals used in interpreting the Framework as symbol.

Applying the “semiotic triangle” to the Framework, the interpretant is the meaning you, the viewer, gives to the sign or representamen used to stand for the Framework or frames. The object is the Framework for Information Literacy for Higher Education, in all its nine pages of description (not including appendices).

In visualizations and signs used to represent the Framework, the process of interpretation is informed by the viewer. In using a symbol for communicating the Framework, the viewer, or interpretant, is affected by prior knowledge. Symbols and shapes mean different things to experts in different disciplines. Using a Venn diagram or spiral to illustrate the Framework hold very different meanings for the biologist and the communication expert.

Howard Riley attributes Petherbridge as saying that “[d]rawing is the primal means of symbolic communication, which predates and embraces writing, and functions as a tool of conceptualisation parallel with language.” ACRL also recognizes that understanding the
abstract Framework might be helped by drawing and offers a series of drawing activities in the ACRL Framework for Information Toolkit.35

The Frames as Symbol

Exploring the Framework through use of symbol is fun and provides a focal point and anchor. The visuals serve as starting points for conversations between librarians and faculty and/or students about the meaning of the Framework. Even excluding color symbology, number symbolism, and shape symbolism, there are multiple considerations to make in considering appropriate shapes. A standalone symbol not informed by data should contain all six frames. Ideally, it should reference the metaliterate learner.

Using the window or threshold metaphor seen in Figure 1 as a symbol, the six frames are collected together. The window has six parts, convenient to hold six frames. In order to place the frames within the window, I must make choices that are reflective of how I understand the frames. For example, I am thinking that the three panes on the bottom are supportive. It is suggested by the shape that the three higher panes are aspirational. The highest point contains a reference to the metaliterate learner, who the frames inform. Another interpretant may show different values, possibly reordering the frames, or placing the metaliterate learner in the outer edge, encircling all frames, or as the base, supporting all frames.

Figure 2: Jannette L. Finch, Window Symbol. Modified from Montambeau with permission, 2020.

Other usable symbols are offered in Table 1 to excite your imagination. Once the mind opens to using symbols to communicate, the possibilities appear everywhere you look. In each symbol, the metaliterate learner can be included as the center, or as the encompassing circle, or as the apex of the shape.
Bird Feeder

Six Symbols Patch or Wagon Wheel

Window in Rome

Venn Diagram
It is a meaningful exercise to think about communicating the frames through the use of commonly found symbols. Immersion into a semiotic space gives new understanding to the weight of the frames, their significance to the viewer, the placement of the metaliterate learner, and how the symbol is perceived. Hoffman and Roth offer:

> by experimenting with diagrams our own thinking becomes an object of analysis. By experimenting with diagrams, we can develop implications of our thought, we can see limitations of our thinking, and we can improve the used representational system either by introducing new elements, or by restructuring the whole system. (italics theirs)

The Structure of this Book

Most of the visualizations in *Envisioning the Framework* are not stand-alone symbols, as seen in this chapter. Instead, the visualizations depict the Framework and frames informed by other elements, such as student learning outcomes, survey results, or alignment with strategic goals.
Several use clever metaphors to communicate the frames or seek deeper understanding through mapping. Many authors acknowledge a disconnect in implementing the frames, but all seek clarity through the use or creation of effective visuals. Mining the text of the Framework is enhanced by regarding the frames in signs and symbols, as visualizations informed by data, or by mapping concepts in tables.

A semiotic study by Deguara and Nutbrown on meaning-making through signs and symbols references Chris Athey (1924-2011), a constructivist teacher and expert in theories of knowledge. In *Extending Thought in Young Children*, Athey describes a child’s development of thought evidenced through drawing. In children, according to Athey, drawing development is sequential, almost scaffolded, into distinct sequences. The symbolic representations of children’s drawings fall into sequences of lines, curves, and space orders. Athey has ordered the sequences into schemas. Although these schemas may appear at different ages for different children, Athey cites large studies involving children from many different countries and affirms that drawing schemas hold across cultures: there is “universality of basic graphic forms.” The schemas observed by Athey are:

- vertical;
- back and forth or side to side;
- circular and rotation;
- going over, under, or on top of;
- going around a boundary;
- enveloping and containing;
- going through a boundary;
- thought as in internalized data or telling a story (as in mapping).

Strangely enough, the action schemas identified by Athey are paralleled by the visualizations provided by chapter authors in *Envisioning the Framework*. Although it might be a stretch, perhaps progressing through the chapters in the same way children progress from a vertical scribble, through circles and zig-zag forms, to enclosures, and then to maps will translate to our understanding of the Framework.

As a child’s spatial journey develops from navigating around their kitchen to the yard outside, and then to the park and to school, their thinking develops into the facility to create cognitive maps. A cognitive map represents the ability to combine multiple schemas “communicating a subjective system of symbolic locations.” A story at this level can express multiple spatial notions in one coherent story.

We will progress in our understanding of the Framework by working through lines, squiggles, circles, boundaries, enclosures, and maps. Using symbols and visuals to ultimately tell a coherent
story featuring the frames and the *Framework for Information Literacy for Higher Education* will help map our understanding.

Howard Riley, expert in the pedagogy of drawing, writes:

> Symbolic language, in all its written forms, appears to have emerged from a background world of visual ambiguity, via our innate capacity for structuring chaos into order, and has permeated our observations of the material world to such an extent that the two have become one: language is the filter through which we perceive the world, it becomes transparent, interwoven with our perception of the fabric of the material world, yet its visible form – writing - remains forever arbitrary, forever open to negotiation. Thus, drawing affords – reveals - understanding, it is a source of knowledge, a language through which knowledge is shared.\(^{41}\)

Riley reminds us that the opening sentence of John Berger’s 1972 television series and book, *Ways of Seeing*, states ‘[s]eeing comes before words.’ Riley explains that perception of our environment is a pre-requisite not only for moving within it and acting upon it, but for reflecting upon it and making sense of it, so as to share with others.\(^{42}\)

The Framework, heavily imbued with theory and threshold concepts, has proved troublesome. Land, Rattray, and Vivian write that “perhaps the threshold concept is so troublesome not necessarily because the concept is so difficult” but because learners are stopped from progressing to a point of understanding by “challenges” to the “learner’s understanding of its component concepts.”\(^{43}\) The environment of the Framework is theoretical and abstract. Plato distinguished between practical and theoretical knowledge and defined the former as grown together with practices while the latter is abstracted from all practice.\(^{44}\) The Framework is abstracted from practice. In considering troublesome concepts, knowledge dispositions and an absence of prescriptive standards,\(^{45}\) we struggle to apply the frames in a practical setting, whether this involves one-shot sessions, credit-bearing courses, institutional goals, student learning outcomes, or communicating the meaning to others.

In the 21st-century, it is “more important for practicing librarians to advance information literacy than it is to consider one set of pedagogical concepts trumping the other.”\(^{46}\) For this reason, I hope that *Envisioning the Framework* succeeds in bringing clarity to understanding the frames and offers lots of ideas for successful implementation.

Jannette L. Finch, MLIS

Editor, *Envisioning the Framework: A Graphic Guide to Information Literacy*
For more on Peirce:

Thellefsen, Torkild and Bent Sørensen, eds. *Charles Sanders Peirce in His Own Words: 100 Years of Semiotics, Communication and Cognition*. Berlin, Boston: De Gruyter Mouton, 2014.

Notes


17. Westley and Folke, “Iconic Images.”

19. Mackey and Jacobson, “Reframing Information Literacy.”


40. Athey, Extending Thought, 114, 156.


42. Ibid, 135.


**Bibliography**


**Biography**

**Jannette L. Finch, MLIS**, is a librarian in the College of Charleston Libraries system. Her research interests include information design and the effect of technology on student learning, online learning and teaching, effective teaching through experiential learning activities, constructivist techniques in the teaching and learning environment, visualizing data, library service models, the library role in the scholarly community, assessment and planning.
CHAPTER 1

Data Visualization: Definitions and Brief History

Jannette L. Finch

Data Visualization: Definitions

The terms data visualization and information visualization are often used interchangeably. All definitions given in this chapter hint at the deeper meaning and understanding that results when data is reinterpreted and patterns revealed through the thoughtful design and rendering of an image. According to Isabel Meirelles, author of Design for Information, representing multidimensional information structures in a two dimensional visual display relies on cognition, analytical reasoning, and visual and spatial perception to create (encode) and to understand (decode). Meirelles says that if decoding is not successful, the visualization fails. Meirelles describes communication design practices in which the main purpose is to inform. Whether using infographics, wayfinding systems, or visualizations of statistical data, all examples “share the common objective of revealing patterns and relationships not known or not so easily deduced without the aid of the visual representation of information.”

Card, Mackinlay, and Schneiderman define information visualization as “visual representations of abstract data to amplify cognition.” Examples provided in Readings in Information Visualization: Using Vision to Think illustrate how consideration of the data used and the purpose of the visualization result in visualizations amplifying meaning, leading to cognition.

Ideally, the act of making a visualization results in discovery. The editors of W.E.B. Du Bois’s Data Portraits Visualizing Black America define data visualization as, “[t]he rendering of information in a visual format to help communicate data while also generating new patterns and knowledge through the act of visualization itself.” Manuel Lima also states that information visualization is a tool for “intrinsic aspiration for sense-making.” His books, Visual Complexity: Mapping Patterns of Information (2011), The Book of Trees: Visualizing Branches of Knowledge (2014), and The Book of Circles: Visualizing Spheres of Knowledge (2017), include visualizations beautifully presented in black and white groupings that allow clear understanding of both their purpose as data illustrators and their place in visualization taxonomy.

Sandra Rendgen describes visualization as a complex process in which concrete phenomena and “also theories, concepts, or ideas, are modeled and coded in such a way that they can be visually interpreted and understood” with the ultimate goal to create images that can be
understood everywhere and by everyone with little guidance. Rendgen states that information visualizations are an intellectual instrument, bridging a gap between scholarly text and artistic image.\(^5\)

The simplest definition for data visualization is found in *Data Visualization: A Handbook for Data Driven Design* by Andy Kirk (2016). In nine words, Kirk offers this definition: “The representation and presentation of data to facilitate understanding.”\(^6\)

**Data Visualization: A Brief History**

Data visualization, making sense of the world through images that tell a story, has a history that parallels human existence. Examples of data visualization can be found in imprints left by the world’s earliest people in the Amazon Rain Forest of western Brazil. In the Public Broadcasting Services (PBS) produced series, *From Caves to Cosmos* (2018), researchers describe cave paintings created some 13,000 years ago as revealing the first peoples as hunters and gatherers, artists and scientists. Many of the grid-like images show “calculated observations of the sky and nature.”\(^7\)

Another well-known example is from the ancient society Mesopotamia where cuneiform abacuses and maps chiseled into stone have been discovered.\(^8\) Also remarkable is a fully scaled map by Chinese cartographers working in 1137 AD.\(^9\) Other notable historical visualizations include the 1786 work of Scottish statistician William Playfair,\(^10\) Florence Nightingale’s coxcomb depictions of causes of death during the Crimean War, Charles Minard’s succinct flow maps, the stark reality of black life in late 1800 America by W.E.B. Du Bois, and John Snow’s dot map showing cholera outbreaks in 1855 London.

The recent growth in the data visualization field is due in part to supercomputing, access to big data, refinements in user interfaces, and the need to interpret patterns and trends among very large data sets.\(^11\) Current visualization experts include authors Isabel Meirelles, Manuel Lima, David McCandless, Andy Kirk, David Polley and Katy Börner, who advance the work through beautiful full color examples of design consideration and data visualization structures. Although data visualization is not a new field, visualization examples are improved in recent books, as publishers have figured out how to include complex graphical representations in what Edward Tufte calls the two-dimensional “flatland” of the book. Commercial publishing limitations is one reason statistician and artist Tufte, called the “da Vinci of data,” self-published his series of gorgeous books, seminal works in the field of visual design.\(^12\)
Data Visualizations in Libraries

In graphics related to libraries, recently published material linking libraries and visualization address aspects like overall functioning, research desk workload, physical space planning, and many examining the visual search interface of digital libraries. Other research in the intersection of libraries and data visualizations address collection development decisions, negotiating resource pricing, highlighting specialized collections, and visualizing archival collections and relationships within history.

There is work in analyzing scholarly community links through citation analysis, emerging scholarship in using data visualization in curricular efforts, the pedagogy of teaching data visualization, and in reviewing data visualization projects from disparate units on campus.

Many libraries are offering data visualization services and expertise, as Duke University Libraries has done since establishing the Data and Visualizations Services Department in 2007. Also known for their data visualization services are the libraries of University of Michigan and North Carolina State University.

Along with these efforts is recognition for increased visualization skills expected of librarians today. A summary of these is provided by Hsuanwei Michelle Chen in “Information Visualization Skills for Academic Librarians.” The article focuses on information visualization and digital humanities research. Chen has also recommended the benefits of investing in visualization skills for librarians and for improved transparency and service for patrons in two chapters for Library Technology Reports.

Data Visualization: A Guide to Visual Storytelling for Libraries is edited by information professional Lauren Magnuson, who has worked as a systems and emerging technologies librarian. The book includes chapters on many aspects of visualizing data in libraries. Although the use of data visualization varies among the chapters, the message of creating visualizations to communicate complex data in a transparent and compelling way is consistent. Included in the center of the book is a collection of colorful library-related visualizations, including comparisons of bar charts and pie charts, choropleth maps, and clusters of terms mapped in several ways as generated in ScholarWorks. The multiple case studies give good guidance on tools to use and on the importance of cleaning your data before generating visualizations.

Other examples of library-related visualization work include a 2015 case study by Murphy on using visualizations to improve decision-making and to “articulate a library’s contributions to the communities they serve” and advocacy by Womack on the need to include instruction in data visualization within the context of information literacy.

Angela Zoss, a Duke University librarian, has published multiple scholarly works on data visualization, including a guide for librarians on creating effective visualizations of library data and has also written on the pedagogy of visualization instruction. Zoss has created a Springshare LibGuide on Data Visualization, found at...
https://guides.library.duke.edu/c.php?g=289678&p=1930713. It includes helpful definitions, tools and tutorials, and a curated page of resources for further reading.

Katy Börner, author of the forward for Envisioning the Framework, is a professor of Information Science and Intelligent Systems Engineering at the Luddy School of Informatics, Computing and Engineering at Indiana University. She has wide expertise in visualization, graphing and mapping, and her published work includes mapping and visualizing scientific citations, classification systems, and much more. Her work extends far beyond the context of library and information science and includes book titles such as Atlas of Science: Visualizing What We Know (2010), Visual Insights: A Practical Guide to Making Sense of Data (2014), Atlas of Knowledge: Anyone Can Map (2015), and multiple academic articles and presentations.

Concluding Remarks

The strength of visualization lies in its ability to reveal truth out of information that may remain hidden in lines of text, large data sets, or complex ideas. In the tradition of Tufte, Börner, Cairo, du Bois, Minard, Lima, and others, why not seek to clarify information in a beautiful way? To envision information, Tufte states, "is to work at the intersection of image, word, number, and art" while recognizing and adhering to visual principles that transcend culture and time. Data visualization and its many branches continues to be a rich field for development. As libraries and librarians continue as keepers of more data and larger data sets, it is time to learn effective methods of communicating patterns and truths using the power of data visualization.

Notes


27. Sarah Anne Murphy, "How Data Visualization Supports Academic Library Assessment," *College and Research Libraries News* 76, no. 9 (2015), 482.


Littlefield Publisher, 2016), 19-44; Zoss, ”Challenges and Solutions for Short-Form Data Visualization Instruction, Pedagogy of Data Visualization,” (workshop at IEEE VIS 2016, eds. Alark Joshi, Eytan Adar, Sophie Engle, Marti Hearst, Daniel Keefe), 3.


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**Biography**

**Jannette L. Finch, MLIS**, is a librarian in the College of Charleston Libraries system. Her research interests include information design and the effect of technology on student learning, online learning and teaching, effective teaching through experiential learning activities, constructivist techniques in the teaching and learning environment, visualizing data, library service models, the library role in the scholarly community, assessment and planning.
CHAPTER 2

Framing the Guides: Transforming LibGuides Creation through Conceptual Integration with the ACRL Framework

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Introduction

Since the advent of the use of LibGuides in academic libraries, these online-based resource pages have been used for a variety of purposes. The reason for this multitude of uses comes from a complex history and intersection of definitive moments within librarianship. It is important
to recognize that Springshare was founded in 2007, only a year after Elmborg’s seminal work on critical librarianship in which he clearly defines the climate of librarianship at the time as a pervasive shift in the identity of librarians as on demand reference service providers to educators and instructors, with ongoing conversations of what that meant in terms of developing our teaching practices.[1]

Throughout all of this, the ACRL Framework for Information Literacy for Higher Education had yet to be developed and instead librarians were utilizing the Information Literacy Competency Standards for Higher Education (which were developed in 2000 and would be rescinded in 2016).[2] The Standards were seemingly more concerned with defining the burgeoning term “information literacy” and offering concrete examples of what students should do to prove their capabilities, effectively mapping to a banking model of education[3] rather than building critical evaluation and questioning into their work. To make matters even more complex, around this time the term “information overload” took on an entirely new meaning in the profession with the influx of digital and online resources. The discussion began to center around how “Information guides and library Websites serve as road maps to the resources in the library and assist in decreasing the amount of time individuals spend searching for materials. Users accessing resources that support their coursework and research interests are also less apt to experience information overload during information search.”[4]

In fact, Blummer and Kenton even went as far as to state, “Foremost, it remains essential that these guides include all relevant resources available to users such as databases, journals, e-books, reference materials, digital collections and Websites, and other open source materials..[5] With all of this, it is not surprising to see why LibGuides began their existence as
the “evolutionary descendants of library pathfinders” and how one of the most common
iterations of LibGuides became an online version of a “pathfinder,” or a proto-LibGuide.[6]

Pathfinders are defined as paper-based list of resources for embarking on research in a
particular subject or for a specific assignment. While there have been valid criticisms of utilizing
the Springshare software to create guides, that is a different conversation than whether guides
can be integral to information literacy instruction.[7]

When Sarah Lawrence College (SLC) adopted LibGuides in the fall 2015 - spring 2016
academic year, LibGuides use was already widespread across higher education institutions, but
due to the circumstances listed above, a lack of focus persisted as to how these tools could be
used and how they could be built into instructional philosophies. The established practices for
creating LibGuides and other institutions’ guides were examined by SLC librarians.
Concurrently, the Framework was being published and disseminated to academic institutions.
The SLC librarians knew that they wanted to make sure guides were contextual and related to
students’ point of need, but with the introduction of the Framework for Information Literacy for
Higher Education, they were able to map to more robust learning objectives.[8]

The Framework was developed in order to move away from a linear and inflexible standards-
based approach to teaching information literacy concepts towards a critical thinking and
threshold concepts-based model of instruction and learning. In light of this sea change in
information literacy instruction theory, the SLC librarians adopted a critical mindset in their
creation and establishment of best practices and templates for developing engaging and
effective research guides for their student population. In addition to this, the librarians also
wanted to create a model for producing research guides that lessened the cognitive load on students, which will be discussed in more detail in this chapter.[9]

**Perspectives on LibGuides and the Framework**

There are many benefits to creating and using LibGuides to support student learning in an academic library setting. One important benefit is having an openly accessible, unmediated collection of discipline-specific research skills and tools that students can peruse at their convenience and at a distance. Even among librarians, sharing knowledge about the best resources and research techniques in a given discipline is important for maximizing time and minimizing knowledge-silo-ing. For example, an English-subject specialist librarian may not be familiar with the intricacies of conducting business research. A strength of guides can also be that they are time-saving didactic tools that can unlock potent information sources and invaluable research methodologies for conducting searches in unfamiliar subjects.

Along these lines, guides can be informal repositories for the expertise of subject-librarians, ensuring that information will not be gone when and if a librarian moves onto another institution. Guides can also be valuable tools for embedding in online course modules and syllabi, and for use in face-to-face teaching to help students visualize information and concepts being shared, follow along, and revisit later. As Smith[10] explains, when Springshare first introduced the LibGuides software, part of the appeal was the ease in which librarians could mitigate and curate information without having extensive web design/creation skills, and that ease of use and ability to insert expertise is still present.

In order to maximize the efficacy of LibGuides for student learning, however, it is of utmost importance to develop them as instructional tools with instructional design best
practices in mind and not simply as lists of resources devoid of important contextual information and metacognitive cues. If we are to take to heart what Booth states, that “intentional instructors do more than communicate well or design strong assignments; they methodically consider the impact their actions have on learners, understand the knowledge they possess, use evidence to support the strategies they select, and strive to improve their effectiveness over time,” then we must be careful to not just build our lesson plans in this manner, but also our instructional tools. In this vein, Little outlines practical guidelines for creating LibGuides that minimize cognitive load in students. These include using simple, clear language, interspersing short blocks of text with visual components such as graphics or videos, outlining research skills and concepts in concise components, and utilizing active learning elements to drive student comprehension of content. Baker further reviews how to create guides to be used specifically as resources for teaching and engaging students in critical thinking beyond the “‘kitchen sink’ approach” of including every possible resource a student might need and ignoring the fact that what they might need most is context. These techniques were all used by SLC librarians when designing subject guides that could be used for student learning in synchronous and asynchronous settings.

The threshold concepts of the Framework further laid the groundwork for re-envisioning what a LibGuide could or should be. The origin of threshold concepts and troublesome knowledge and its entree into information literacy instruction is well-documented in the library literature. The introduction of the Framework also lays out the conceptual underpinnings of threshold knowledge and its intersection with “backwards design” for effective instruction. In order to transform the model of LibGuides from lists of resources into instructional tools, the guides were
created as visual and instructional aids to help students begin to engage with and eventually grasp Framework threshold concepts. This was essentially intended as a form of instructional scaffolding—an initial introduction to a “troublesome concept” in the classroom, and then an online platform for students to revisit the concepts later. Walton and Archer discuss the use of web resources in this way: “In this sense, scaffolding identifies elements of a task that are initially beyond a learner’s capacity and allows learners to focus on aspects of the task that they can manage.”[16]

Broadly speaking, the threshold concept Searching as Strategic Exploration was the theoretical underpinning for many of the research guides with the librarians at SLC creating content that dissected the iterative nature of research and the need for evaluating resources. With this frame in mind, the overall purpose of each individual guide, whether designed to cover research in a specific discipline or for a specific class assignment, would be built around the “strategies” or research methodologies appropriate to the subject. Each guide provided a “set of resources,” ranging from the usual academic databases and books, to librarian-vetted websites of organizations and tips to strategically search the open web, that would allow exploration of a discipline or research-area to satisfy the needs of the “novice” researcher through the graduate student.[17] The guide content would then be designed as a strategic, engaging, question-provoking terrain for students to interact with when embarking on a research project. Visually speaking, even the tabs of each guide were further designed to help students navigate content strategically. Each tab was designed towards an action a student might need to take such as “Evaluating Sources” or “Keeping Track of & Citing Sources.” Other frames were utilized to build specific content on different guides. Below is a chart mapping the Frames to frequently used content boxes created by the SLC librarians.
<table>
<thead>
<tr>
<th>SLC Guide or Box Content</th>
<th>Framework Concepts</th>
<th>Content Demonstrating Framework Concepts</th>
</tr>
</thead>
</table>
| Academic Integrity & Avoiding Plagiarism Guide | Information Has Value, Authority is Constructed and Contextual, Scholarship as Conversation | ● Definition of Academic Integrity from the SLC Student Handbook  
● Video breaking down 10 lesser known types of plagiarism  
● Box explaining what plagiarism is and why it’s important to cite  
● Content explaining what open access is and the development of it  
● Resources for learning more about the changing landscape of information and scholarship  
● Content explaining what a scholarly community is and stating that SLC students are part of such a community  
● Page devoted to explaining copyright and fair use |
<table>
<thead>
<tr>
<th>Boolean Operators box</th>
<th>Searching as Strategic Exploration, Research as Inquiry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● Showing students how to transition from a self-selected research topic or question into a Boolean search statement, step by step</td>
</tr>
<tr>
<td></td>
<td>● Visual aid to demonstrate “The act of searching often begins with a question that directs the act of finding needed information” and how to “use different types of searching language (e.g., controlled vocabulary, keywords, natural language) appropriately”</td>
</tr>
<tr>
<td></td>
<td>● Visual aid demonstrates students should “deal with complex research by breaking complex questions into simple ones”[18]</td>
</tr>
<tr>
<td>Subject vs. Keyword box</td>
<td>Searching as Strategic Exploration, Research as Inquiry</td>
</tr>
<tr>
<td></td>
<td>● Visual aid to illustrate the difference between these search strategies and “match information needs and search strategies to appropriate search tools”[19]</td>
</tr>
<tr>
<td>Topic Development box</td>
<td>Searching as Strategic Exploration, Research as Inquiry</td>
</tr>
</tbody>
</table>
|                       | ● Questions to consider with steps on starting research to assist in the discovery process that outlines how to “utilize divergent (e.g., brainstorming) and convergent (e.g., selecting
| Evaluating Sources pages and boxes (often customized for research guides of specific disciplines) | Authority is Constructed and Contextual, Information Creation as a Process | ● “Questions to Consider” box poses questions for students about who created, published the information and for what purposes.  
● NCSU’s “Peer Review in 3 Minutes” video demystifies the peer review creation process. This video was shown often in library instruction and re-used often on evaluating pages on the guides.  
● “Quick Tips to Help you Judge Hard” prompts students to look beneath the traditional “author, audience, purpose” to think about bias and to scrutinize the “facts” and evidence given.  
● “Learn About Scholarly Articles” box set forward information about why the information’s final format as varying forms of scholarly publications conveys special meaning to help understand the content and intent of the author. |
Since the Framework was created to be fluid, moving away from the practice of utilizing set standards, the librarians were able to embed the frames in ever-evolving and creative ways; oftentimes merging multiple frames for one guide and/or box. LibGuides are a natural fit for building instructional tools that engage with a more versatile structure, like the Framework, because of the fact that they are intended to be living and malleable resources. The LibGuide software allowed the SLC librarians to build resources that can be quickly edited to match evolving patron needs and be expanded on to build more robust content for any given guide. For example, returning again to the Academic Integrity guide and Information Has Value, the librarians were able to copy and adapt that content for other guides that would make sure that they in turn reviewed different concepts of Information Has Value but also might expand on a frame such as Authority Is Constructed And Contextual.

Collaboration, open communication, and creating best practice documents was a significant part of the work to create these adaptive and instructional guides. Building these practices into the workflow allowed for a more efficient and cognitive approach to be established in order to create more robust content, but it also allowed the librarians to build in sustainability for the maintenance of guides for years to come.

**How We Got Started**

In starting the project of implementing guides into the research services landscape at the college, it was important to communicate to the administration the needs of the community and the positive outcomes guides would have. In order to make the case that the library should purchase a LibGuides subscription to support student research the librarians reviewed literature and scanned other campus guides then drafted a report on how to implement LibGuides at the institution while also supporting the development of scaffolded instruction. While the Framework was not directly incorporated into this document due to the intended audience, librarians had
robust conversations of how the Framework would play a role in establishing a more comprehensive instruction program that these guides could support. Much of the conversations revolved around “searching as strategic exploration” and how the librarians needed to better engage our students with the knowledge that “Searching for information is often nonlinear and iterative, requiring the evaluation of a range of information sources and the mental flexibility to pursue alternate avenues as new understanding develops.”[21] Therefore the intention of the guides was not to just list resources, but to further teach students about necessary Framework concepts that the librarians were able to identify as lacking in the current research narrative on campus.

With the audience of the report being administrators who were not involved in the daily activities of instruction and reference, the report included information on usability, necessities of maintenance and sustainability, benefits of the product, and specific applications for the institution. It was made clear that not only could guides be utilized for instruction but also for outreach to the institution (including faculty and administrators) and the library’s outside partners. The direct goals of allowing librarians to “be with students as they learn by doing, where one-shot classes and a single consultation cannot be enough” and make all our community feel supported in their work was outlined to convey both the needs of the institution and the pedagogical approach to adopting guides.[22] Once the team decided to move ahead with the adoption of guides, they worked on disseminating the message about the benefits of these resources and structuring the roll out to meet institutional needs.

In order to ensure that the guides would be adopted and relevant to the college community, particularly its students, it was important to communicate about the guides in a variety of ways. Though most guides were primarily created by individual librarians, robust communication and
collaboration in the research services department was built into the process of creating guides in order to enhance concepts through multiple perspectives and make sure they projected a cohesive voice and mission. Library staff and faculty from disciplines related to the guide topic were notified and encouraged to provide feedback after the creation of a new guide. One avenue through which the librarians invited this collaboration was via a Google form placed on all guides asking users to suggest a resource. All of this was done to help promote the use of guides but also to build “a community of contributors, with no one person as the gatekeeper” with content being included “based on conversations and activities meant to empower all learners and educators.”[23]

Systematic use of the LibGuides in library instruction and research consultation was easy to implement due to the nature of the small research services staff at the library and the fact that the resources were being built to specifically meet instructional needs for specific courses or Framework concepts. This meant that students were exposed to the content of the guides at point of need and instructed on how to navigate them. Another important aspect is that threshold concepts, by nature, are troublesome and require multiple interactions with the concepts in order for students to begin to understand them. By using the guides at multiple points during instruction, during individual research consultations, and encouraging students to use them later during their own research process when they forgot class content, the guides began to operate as visualizations of Framework concepts. This intended purpose of the guides offered “…us the opportunity to engage our students throughout their entire research process, at any time or any place that they might be working. The knowledge and guidance from librarians that we know our students utilize through formats such as Research Consultations will be accessible on a more comprehensive scale.”[24] By building our guides holistically and collaboratively, they became all the more robust because we were able to discuss what
concepts students were having a hard time grasping in classes and consultations and then build those Framework concepts into the guides. For example, our emphasis on embedding information literacy concepts into our visual content enabled our work to be both a point of reference and a reference tool. Furthermore, the librarians made a point to create content from varying perspectives and that allowed students to question the common narrative in any given field. This was specifically done to incorporate the concept of “Authority is Constructed and Contextual” with emphasis on how “Experts understand the need to determine the validity of the information created by different authorities and to acknowledge biases that privilege some sources of authority over others, especially in terms of others’ worldviews, gender, sexual orientation, and cultural orientations.”

Once buy-in was established from administration, the librarians isolated both specific guides and critical thinking exercises that the students could benefit from. These included: the Boolean Operators box, Evaluating Sources boxes and pages, and Avoiding and Defining Plagiarism boxes, pages, and guide. As demonstrated in Table 1, these were all inspired by or mapped to Framework threshold concepts. The mechanics of developing and implementing a cohesive approach for designing and developing LibGuides involved several areas of preparation. An important initial task was prioritizing which guides to create first by assessing areas of need. The librarians developed a list of in-demand research subject areas by reaching out to academic faculty for feedback. Librarians also asked themselves what kinds of consultations they were seeing and what subject areas students were researching more than others. Posing these questions allowed the librarians to approach the creation of new guides with care and intention centered around student voices and success.

From this it was decided that non-subject specific guides, such as Finding Resources and Interlibrary Loan, should be created in addition to subject guides like Health Sciences,
Psychology, and Sociology, and that additional program specific guides should follow for the graduate programs in Women’s Studies and Health Advocacy. Next, the librarians created a style guide to ensure the research guides would have visually cohesive design elements such as fonts and color choices. A LibGuides template with standardized boxes for reusing and mapping across guides was also developed. These standardized boxes were created for various Framework concepts and knowledge practices that librarians found themselves frequently revisiting in research consultations and in library instruction. The creation of the boxes allowed librarians to use these visual aids for teaching students the concepts, and then this content could be accessed by students again later. These boxes consisted of instructional text accompanied by graphics, infographics, and visual tutorials. Graphics were designed in-house by the librarians while tutorials were both gathered from outside sources and created at the institution to match specific needs.

An example of one of these boxes is the Boolean search statement visual tutorial, shown in Figure 1, created to be reused on all subject guides to reinforce the process of moving from a research topic to search statements. This was created as a visual aid to demonstrate that, “The act of searching often begins with a question that directs the act of finding needed information,” and how to “use different types of searching language (e.g., controlled vocabulary, keywords, natural language) appropriately.” It also visually assisted students in, “deal[ing] with complex research by breaking complex questions into simple ones.”[26]

In creating this content, the librarians used as inspiration guides and best practices created by other institutions. The Boolean search box was adapted from the AND/OR/NOT box on Butler University’s guides [https://libguides.butler.edu/c.php?g=117303&p=1940708]. It was important that the content utilized from other institutions included acknowledgement but also options for
other LibGuide creators to take advantage of the adapted content through a creative commons license.
Create a Search Using Commands

1. Isolate keywords from your topic.

   Librarians find the most effective way to teach students information literacy is through active learning.

2. Narrow your search results to include both of your keywords using AND.

   librarian AND “active learning” AND “information literacy”

3. Continue building onto your search, and expand your options using OR to find similar terms.

   librarian AND “active learning” AND “information literacy” AND (student OR researcher)
Another example of using Framework concepts in standardized materials or templates was the Evaluating Your Resources page, shown in Figure 2, that was mapped, reused and customized on all subject guides and tutorial guides. This content was inspired by “Authority is Constructed and Contextual,” and “Information Creation as a Process.” The “Questions to Consider” box poses questions for students about who created, published the information and for what purposes, calling upon the Knowledge Practice, “define different types of authority, such as subject expertise (e.g., scholarship), societal position (e.g., public office or title), or special experience (e.g., participating in a historic event).” The use of the NCSU “Peer Review in 3 Minutes” video demystifies the peer review creation process, setting the stage for students to understand, “the traditional and emerging processes of information creation and dissemination in a particular discipline.” This video was shown often in library instruction and re-used often on evaluating pages on the guides. In concert with that video, the “Learn About Scholarly Articles” box set forth information about why the information’s final format as varying forms of scholarly publications conveys special meaning to help understand the content and intent of the author. The content in “Quick Tips to Help you Judge Hard” counters and complicates that knowledge and prompts students to look beneath the traditional “author, audience, purpose” to think about bias and to scrutinize the “facts” and evidence given. The following Dispositions of Authority is Constructed and Contextual were the catalyst here: “develop awareness of the importance of assessing content with a skeptical stance and with a self-awareness of their own biases and worldview,” and “question traditional notions of granting authority and recognize the value of diverse ideas and worldviews.”
Again, these resources combined in-house created content and materials sourced from other academic institutions. Box content included the following:

- “How Do You Evaluate Sources?” which posed critical questions for students to consider when selecting sources and included a video “Evaluating Sources for Credibility” from NCSU Libraries [27];
- Information on differentiating between primary and secondary sources [see Figure 3];
- Content on how to identify scholarly articles and the basics of the different “types” of research in various disciplines;
- And information about how to “evaluate websites of organizations” [see Figure 4].
Figure 2. Evaluating Sources Page was mapped on all SLC subject guides and customized for different academic disciplines.
Primary and Secondary Sources

What is a Primary Source?

- A direct source from a particular event; a first-hand account from someone who was involved in an event; a work that was created during the time period studied.

- A diary, newspapers from the time an event took place, a personal letter or correspondence.

What is a Secondary Source?

- Uses primary sources to make an argument or provide an analysis; not from the direct time of the event it is describing.

- Criticisms, commentaries, a document that reviews or interprets a previous event or findings.

The Long Road Home by Ben Shephard

Call Number: D808 .S54 2011
ISBN: 9781400004061
Publication Date: 2011-02-22

Can a Source be Primary and Secondary?

Simply put, yes. For example a documentary about World War II could be used as both a primary or secondary source. It could be used as a primary source if it has first-hand accounts or if you are studying the art of documentary. It could also be used as a secondary source because it uses primary source material to analyze an event.

White light, black rain: the destruction of Hiroshima and Nagasaki by Steven Okazaki; Takumi Kawasak; Steve Conidetti; Masafumi Ichinose HBO Documentary Films

Call Number: D767.25.H6 W45 DVD
ISBN: 0-7624-3208-8
**Figure 3.** Primary and Secondary Sources box from Evaluating Sources page that the librarians utilized on humanities and some social science guides while making sure to not include on science specific guides due to the difference in definitions.

**Evaluating Websites of Organizations**

Use these tips to evaluate the websites of organizations. Keep in mind that these are only a starting point and not guaranteed to be failsafe in every situation.

<table>
<thead>
<tr>
<th>Vetting Organizations</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reputation</strong></td>
<td><strong>Web Address</strong></td>
</tr>
<tr>
<td>Is this a well-known, well-regarded organization? Have you heard of it before?</td>
<td>Does the URL end in: .edu, .gov, .org? (Note: this is not always foolproof. URLs of all types can be bought.)</td>
</tr>
<tr>
<td><strong>Funding</strong></td>
<td><strong>Mission</strong></td>
</tr>
<tr>
<td>How is the organization funded? (Hint: Government-funded, private donations?)</td>
<td>What is the stated or implied mission of the org.? (Hint: Look at the “About” page.)</td>
</tr>
<tr>
<td><strong>Leadership</strong></td>
<td><strong>Accuracy/Bias</strong></td>
</tr>
<tr>
<td>Who runs / founded the org.? What can you find out about them? (Hint: Can you find more through a web search?)</td>
<td>Does the information presented on the website appear truthful / impartial, or incorrect / biased?</td>
</tr>
</tbody>
</table>

**Figure 4.** Evaluating Websites of Organizations.
The librarians reused this Evaluating Sources page and boxes on many different subject and tutorial guides, including on a guide called “Evaluating Information: Vetting Your Sources: Evaluating Academic Sources.” On this guide, the librarians expanded the concept of evaluating sources to reflect evaluating both academic and non-academic sources, including journalism. An example of an additional box created for that purpose, shown in Figure 5, is “Quick Tips” for evaluating journalism.
QUICK TIPS TO HELP YOU JUDGE HARD

Remember: Read the entire article, not just the headline.

🔍 Check the dates: is this still relevant?
Information can have an expiration date. If not using for historical content it is usually good to use the most up-to-date sources especially with news.

🔍 Find the sources/"facts."
If a citation is given, check on it. Can't find the source or corroborate information given? Try to find out more about the topic so you can judge more thoroughly.

тельно Validate author credentials.
Is the author specialized in the field they are writing about? Do they work in the field? Check for authority and accuracy.

⚖️ Look for bias or loaded/extreme language.
Does the lean towards a particular point of view? This may not be the entire story.

• NPR: A Finder’s Guide to Facts

• Quick Tips to Help You Judge Hard: Check Sheet

We are deeply indebted to Indiana University East’s Fake News Guide for these tips.
Figure 5. “Quick Tips to Help You Judge Hard” was created to help students evaluate journalism.

Being the first to introduce LibGuides to the SLC library discourse meant that the librarians were in the unique situation of being able to build from the “ground up.” Building LibGuide content from scratch brought with it some major benefits, such as being able to structure the content as outlined above. The librarians were able to work on creating robust material that acknowledged the complex nature of research and worked to avoid “creating LibGuides that define research through its resources...unconsciously reinforce[ing] academic power dynamics, limit[ing] dialog and marginaliz[ing] the student voice from the very academic conversations that surround them….center[ing] the professional librarian’s existence on an assumption of student ignorance, a particularly insulting observation.”[28] However, trying to create guides that offered a contextual review of research and resources with only two librarians working as the primary content creators also became a challenge due to time constraints. This meant that even though librarians never published guides that they thought would not be useful and offer at least some recognition of student needs and Framework concepts, there were times that guides were published that did not project this pedagogical approach as completely as the librarians would have liked. However, with guides being living and dynamic platforms, the hope was always that these could be advanced and expanded upon in years to come and that laying the groundwork would be a substantial move forward towards creating resources that “emphasize dynamism, flexibility, individual growth, and community learning.”[29]
Lessons Learned

Though there was much done to create guides that built on the Framework and utilized instructional pedagogy to improve student learning, mistakes were made in the process as is common for any large-scale project with many different moving parts. For instance, one area for further development would be to enhance certain features of the guides to align them with current accessibility guidelines. Charts and infographics, for example, which were custom-made by librarians for the purpose of chunking difficult concepts into more visually appealing layouts, are not readable by screen readers. It was an unfortunate fact that with such a small team and with a large quantity of work to be done—in addition to the fact that the librarians had internalized biases of being able bodied—this step was overlooked in the beginning stages of creating the content. While it might seem easy to say you are too busy or aren’t an expert on accessibility, to not think about it first and foremost in your design strategies is a mistake. As Booth states, “You might think that learning about accessibility will be too time-consuming to fit into an already busy schedule, or too esoteric to benefit many patrons. Not so. Considered from any angle—from public service and instructional excellence to sound information design to legal compliance—encouraging accessibility in libraries is always good practice.”[30] It would be important for SLC to re-evaluate the workflow for creating this type of content.

The librarians involved in this project continue to work at their current institutions to create accessible content and have identified key resources to assist with this endeavor, such as Colorable, SiteImprove, WebAIM, and of course the Web Accessibility Initiative (WAI). There are also many institutions that have created guidelines for accessibility that they have placed on LibGuides, such as Butler University and Seton Hall. Techniques for making infographics accessible include providing alternative text or CSS code in addition to separating purely
decorative images from text, entering any text directly into the LibGuides boxes and providing alternative text for the decorative images. Along these lines, it could be beneficial to work with online instructional designers to further enhance the guides to conform to Universal Design standards.

Another area of improvement would be to embed more active learning directly into the guides. Springshare has a product called LibWizard that allows for the creation of surveys, quizzes, and forms that can then be embedded into LibGuides. There are also free online tools for creating similar interactive content, but an advantage to the LibWizard tools is that data can be collected within Springshare. Surveys and forms can be used to solicit feedback from students about the degree of usefulness of the guides and to ask in what ways the guides may be lacking or incomplete. Quizzes can be used to further incorporate scaffolding of the Framework more completely and conduct knowledge checks. In including these tools, the objective should not be to merely test the knowledge of students and create a passive learning environment, but rather to “reduce cognitive load and stress on working memory; engage students through metacognition for deeper learning; and provide a scaffolded structure so students can build skills and competencies gradually towards mastery.”[31]

Reimagining Your Own Guides

Librarians interested in taking a holistic approach to conceptually revamping their institution’s guides may consider a few different strategies. One such approach could be to both look at current usage statistics and to interview all library employees, including student workers, to best understand how the guides are currently being used and how they might best be used going forward.[32] In conducting this analysis, we suggest that one build an environment centered on
an ethics of care in order to not just understand how to edit guides but also how to maintain them in a sustainable way that creates community and supports all involved.\textsuperscript{[33]} This is important for constructing a working environment where all voices are heard and respect is given to the amount of work that must be done in order to build such comprehensive learning tools. It is vital to keep in mind that while mapping to frames in LibGuides might be a best practice, it is also inevitably going to be more work than the “kitchen sink” approach and that “including multiple people in the guide creation can foster more egalitarian LibGuide practices and applications across subject, course, and topic guides. Guide maintenance should be an iterative process with frequent reevaluation so that librarians can ensure that the guides reflect multiple perspectives and ideas as they emerge and evolve.”\textsuperscript{[34]}

Conducting an informal SWOT analysis could be a similar approach. Alternatively, or in addition to these methods, a LibGuides workshop, or a series of workshops, in which librarians come together to identify which threshold concepts make sense to explore in the context of re-envisioning the guides at one’s institution could also prove fruitful. Continuing to support the work and maintenance of the guides could also entail hosting labs where library staff LibGuide “experts” float around the room while creators have time to work on their individual guides. This space can also act as an informal platform for people to ask questions and raise concerns about guide work and/or building in pedagogical approaches to their content which will in-turn lead to ongoing discussions on how to adapt the resources to meet the needs of the community. Ultimately, it is important to understand that every institution will be different, both in the types of patrons they serve and the organizational and work culture represented, and therefore a thorough needs assessment for staff and learners alike needs to be performed. However, in that work it is essential that standards are created and that work is done to inform all LibGuide creators on the best practices and ways to implement them into their daily work. As Fritch and
Pitts state, “Creation and implementation of LibGuides standards is a complicated and lengthy process….It is important to approach the process strategically but remain nimble to address unforeseen challenges and deviations in your plans.”[35] Adding to that, you must also be nimble to address the various needs and learning styles of the staff working on the guides.

**Conclusion**

By not recognizing LibGuides as powerful instructional tools and therefore building in the Framework and other pedagogical resources, we have been doing a disservice to our learners. “In short, while librarians have started to think about the nature of critical pedagogy in the classroom, a failure to subject instructional materials to the same processes of reflective, critical thinking serves to dehumanize both our students and the nature of research and inquiry.”[36]

The work that was conducted at SLC demonstrates that despite many voices in our field stating that LibGuides are not effective tools and are not used by patrons, the real reason for this is not the software but rather our approach to utilizing it. By building LibGuides with the express intention of incorporating the Framework and *instructing* learners, not just pointing them towards resources, the SLC librarians were able to build valuable resources for their instruction sessions (including consultations) and for point-of-need information literacy instruction.

The Framework has changed the way librarians approach instruction—moving away from a one-size-fits-all competency-based approach to a research concepts-based, critical thinking approach. Our learning tools, including LibGuides, should be included in this shift. Understanding that the Framework was designed to allow librarians to design learning outcomes to meet the needs of their communities, LibGuides can and should also be treated as
an extension of face-to-face and virtual classroom instruction and mirror and map to these localized, Framework-based learning outcomes.

Incorporating the voices of students and faculty within the community helped to establish LibGuides as a part of their research toolkit as opposed to a one-time use resource. Conducting outreach, such as social media posts like “Review A Research Guide” and incorporating the guides into instruction sessions (many times utilizing the graphics and explicitly stating how to find the guides and that they could be a useful tool for lessening cognitive load), also helped to promote them as resources for the entire research process. In seeing the LibGuides as a research service and approaching it as such, the SLC librarians were able to offer assistance on a much larger scale than was previously possible and also have access to each other’s subject and class expertise. The LibGuides usage statistics over a period of a little over two years, shown in Figure 6, reflects this adoption and growing usage by the SLC community. In addition to the content of the LibGuides being created to reflect the needs of the community, promotion and the soliciting of feedback by SLC faculty and students was key to this usage growing over time.

![Homepage Tracking](chart)

*Figure 6. LibGuides usage statistics over a two-year period shows steady growth over time, with lull periods during points in the academic calendar when students were not conducting research as frequently and with the months of October and November being the most research intensive at SLC. October 2016 had 606 views and November had 524. By 2018, October had 977 and November had 484. December also increased from 111 views in 2016 to 280 in 2018. With an FTE of around 1,400 students, this represents quite a substantial amount of use.*
Another key component to the success of guides and the incorporation of Framework concepts into them was collaboration. Collaboration is the key to creating a more intentional and thoughtful LibGuide presence. A lot of the work that happens in creating, maintaining, implementing, and promoting LibGuides requires a lot of invisible and collaborative labor. It is impossible to be successful in these efforts without the support network of colleagues and peers. From brainstorming activities for instruction, to putting the final touches on a specific design, it is only by doing this work collectively that we can succeed in transforming LibGuides from a software tool with limited capabilities to a truly effective and enriching pedagogical resource.

Further, no guide is created for a singular, universal purpose; there will never be one guide to rule them all. Though resources can be created for re-use (or mapping and copying as it is known in LibGuides) in order to help build in sustainable maintenance practices and avoid multiple recreations of the same content, LibGuides as a pedagogical tool for information literacy should be created for their specific learning community. There are myriad variables to consider when thinking about how we as librarians can best serve our communities, and this point is crucial to keep in mind when we create and maintain guides. Even though, as mentioned already in this chapter, LibGuides as a software tool has limitations, the potential for this particular tool to reach each and every member of a learning community, no matter the size, is immeasurably potent.

It is our hope that after reading this chapter, our fellow librarians will be inspired to reimagine their own guides not only with the Framework in mind, but perhaps with an intentionality that had otherwise not been present and with tangible ideas and strategies for moving forward. In what ways can this tool work better for your patrons, your colleagues, and
your workflows? In what ways are you already doing that work with this tool and how could you expand upon that?

Notes


[18] Ibid.

[19] Ibid.

[20] Ibid.

[21] Ibid.


[26] Ibid.


[29] ACRL, “Framework for Information Literacy.”


[32] One librarian involved in this project has already begun the process of revamping guides at her current institution and has employed the interview approach in order to create a report of common themes, concerns, and ideas that the entire library staff feel are important.

[33] Maria T. Accardi, *The Feminist Reference Desk: Concepts, Critiques, and Conversations*, Series on Gender and Sexuality in Information Studies; Number Eight (Sacramento, California: Library Juice Press, 2017). This book was hugely influential for the authors in building feminist ethics of care into their daily practices. Of particular interest for this work are the chapters by Howard and Hoppe and Jung.


[36] Hicks, “LibGuides.”

**Bibliography**


**Biographies**

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CHAPTER 3

Teaching with Infographics
Visualizing the Frames in Information Literacy Instruction for First-Year Students

Laura Wimberley, Assessment Librarian, California State University Northridge
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Infographics are a vivid, concise, colorful means of communicating dense information clearly. Librarians can use infographics with patrons in instruction sessions, at the reference desk or during virtual reference, as printed signage, or on LibGuides or other library webpages. Unlike text-heavy web content, they are ideal for social media – infographics replicate nicely on platforms like Facebook, Twitter, Pinterest, and Instagram. This approachability makes them ideal for communicating the challenging concepts of the Framework to first-year undergraduate students, in a way that reduces library anxiety.
The chapter introduces the five pillars of design thinking and applies them to two detailed examples to help readers to create their own visually compelling, communicative infographics of the Framework.

**Design Thinking**

Design thinking is a human centered approach to creative problem solving. It has been used in libraries in various ways including innovative service upgrades, curriculum redesign, and renovating public areas. Examples of how design thinking can be applied in academic libraries can be found in Steven Bell and John Shank’s 2007 book *Academic Librarianship by Design: A Blended Librarian’s Guide to the Tools and Techniques*. The design firm IDEO also has available a free toolkit for patron centered design, *Design Thinking for Libraries*, that serves as an introduction to “discover what our communities want and experiment to create services, programs and processes to meet their changing needs.”[1] The process generally has five design phases:

1. Empathize
2. Define
3. Ideate
4. Prototype
5. Test

Applying the design thinking process to create infographics can be an effective way to build visually compelling communicative material. The five pillars of design thinking provide an iterative process to design and redesign based on the main objectives and goals you want the infographic to communicate. Going through each stage of the process shapes and refines creative
ideas, generates feedback, and applies in real life teaching scenarios. The stages are not necessarily sequential. It is a non-linear process that can be repeated, which might be necessary when going through the prototyping and testing phases. This chapter will examine each design phase and apply it to the creation and use of infographics with first year students to communicate the concepts of the ACRL *Framework for Information Literacy for Higher Education*, specifically via the topics of annotated bibliographies and how scholarly articles appear in databases.

**Empathize**

The first phase is to empathize with your target audience and imagine stepping into their environment. Will they have any prior knowledge of the concept – in this case, one or more of the Framework Knowledge Practices - you are trying to communicate? Does the topic of the infographic match the skill or knowledge level of your audience? This requires you to know some background information of the audience, including size and/or any special characteristics they might have.

Our challenge as librarians is to disseminate and teach information literacy and ACRL Framework concepts to first year freshman students. Our audience is first year freshman college students taking California State University Northridge (CSUN)’s University 100 course. There are 25 students in each section of the course; during the fall semester, there are 65 sections. In total, about a third of all first-time freshmen students take University 100. About half of the first year students at CSUN are first generation college students, with slightly more women than men. Eighty to eighty-five percent are from the surrounding community in Los Angeles County.
Many of these students have never written an annotated bibliography, and most do not know what scholarly sources are.

Because our students are at the very beginning of their academic careers, we have chosen to focus on the knowledge practices of the Framework. The knowledge dispositions emerge in learners as they repeatedly engage in the knowledge practices. Our students have not yet had time for the deep, ongoing praxis required to inculcate the dispositions, so we begin with the practices. Given this need for a friendly, beginner-level approach, the knowledge practices are ideal candidates for potential infographics.

Define

In the define phase, you must analyze and synthesize what you learned in the empathize stage to identify the main problems in “a meaningful and actionable problem statement, which the design thinker will focus on solving.”[3] During this phase, you may be working in tandem with the empathy stage in order to interpret the main issues your target audience faces, while collecting and making sense of the data to create a problem statement. A good problem statement is human-centered, broad enough for creative freedom, and narrow enough to make it manageable.[4]

Library concepts and educational jargon can be difficult for freshman to comprehend. Typical freshman students often need to be reminded to put their phones away, pay attention during the library workshop, and take notes. Students are likely to daydream if material is not engaging, leaving them underprepared to complete college level work. With limited amount of time and resources librarians have with students, particularly when offering instruction on such a large
scale, we must come up with effective teaching strategies to bridge the learning gap and get students prepared for college level research.

Design thinking proposes “How Might We...?” questions to define your problem in order to move on to the next phase where you think of solutions - Ideate.

Our defined issue:

*How might we engage freshmen students in Framework knowledge practices to prepare them for college level research and writing?*

Another defined issue would be:

*How might we utilize infographics to teach freshman college students Framework knowledge practices?*

During the empathizing and defining stages we determined the medium to communicate Framework knowledge practices would be infographics. This decision was made anecdotally from our previous library sessions with students and with YouTube data collection on the library videos. So why an infographic and not a video? Two main reasons: retention and accessibility. Students often do not watch videos all the way through. The Annotated Bibliography Research Therapy video was previously used as part of a pre-tutorial to their first library session.\[5\]

Looking at YouTube analytics, we found that only 41.8% of viewers watched all 2 minutes and 55 seconds of the video; the average viewing duration is only 2 minutes and 8 seconds. If students are not watching the video all the way through, they are missing informative content that could help them be more successful completing their assignment.
The other reason we chose an infographic is convenience or accessibility factor. It would be easier for students to have that content on one sheet than to pause and replay a video. For example, students could pull up the infographic on a second screen and have that information close by while they are writing their annotated bibliography. Millennial and Generation Y students often study with one main screen open for document creation and another, smaller screen open for content consumption.[6] Infographics are ideal for leaving open on that second screen; they are easier to use for a brief glance than either a video or a traditional text. For these reasons we choose the infographic as the tool to disseminate our framework content. During the Ideate stage, we will determine which frames and knowledge practices would be ideal in an infographic.

**Ideate**

The ideation stage is when you begin generating ideas to solve your defined issue. With a solid understanding of the background issues and a defined *How Might We* question, we can now brainstorm and generate ideas to creatively design the infographic. As Dam and Siang have outlined, “The main aim of the Ideation stage is to use creativity and innovation in order to develop solutions.”[7] Working in groups is ideal in this stage, in order to develop many methods, activities, and innovative ideas. Brainstorming can be problematic and unproductive if not facilitated and organized with some general rules. Interaction Design Foundations offers best practices and brainstorming rules to prepare for the ideation stage.[8]

The specific type of idea needed for a clear, interesting infographic is an analogy. To effectively communicate ideas as abstract as those of the Framework, librarians must rely on analogies or
metaphors. An analogy communicates by relating an unknown object or idea to something known to the audience.

Analogies are especially vital when translating the Framework into a visual medium. The Framework itself is entirely text. While the concepts of the Framework can be applied to analysis of visual media, the legacy of print shows clearly in its vocabulary and common applications. Any visual depiction of the Framework implicitly carries some analogy. Even arrows are an analogy: the idea of moving “up” or “down” a conceptual hierarchy is a spatial analogy, as is the idea of “broadening” or “narrowing” a concept. Spatial metaphors like these are so thoroughly embedded in our language that we often don’t even recognize them as metaphors,[9] but when we closely examine our word choices, we can start to see hints of visual layout already implicit in our thinking.

Other common analogies we barely recognize as such are bodily analogies (as when we scan the text for “head”ers and “foot”notes) and market analogies (do we “buy” an author’s argument? what’s the “payoff” to iterated search?). For a compelling, memorable infographic, we need to identify these metaphors and explicate them visually. Many librarians have intuitive analogies that they use as examples when speaking casually at the reference desk or off the cuff in the classroom, and it is these go-to turns of phrase that make excellent fodder for the foundational metaphors for infographics.

The success of an analogy depends on two keystones built on the pillars of design thinking. (We will return to architectural analogies below). First, how detailed is the analogy? How many components are there in the objects or concepts being compared that function and interrelate similarly? The more points of comparison that you can draw, the richer the analogy, and so the
more illuminating and useful it is to your audience. You may not choose to highlight all of the similarities in your infographic, in order to keep the infographic visually simple and streamlined, but as your reader thinks through the comparison, ideally even more insights will reveal themselves.

Secondly, how familiar is the comparison object to the audience? How thoroughly and intuitively do they understand how the metaphorical object and all its constituent parts work together? Difficulty with this pillar is a common challenge for our students reading classic literature: for example, for millennia, writers have used agricultural metaphors for which contemporary urbanites and suburbanites have no context. Make sure your Framework analogies do not rely on objects like card catalogs, Yellow Pages telephone directories, or other seemingly simple referents that your students are unlikely to know well.

Analogy allows us to explore the frame **Information Has Value** by comparing plagiarism to squatting. By comparing an author’s work to the visceral concept of home, it emphasizes how exploitative it is to take work without proper attribution. The analogy also introduces the frame **Scholarship as Conversation**, by specifically teaching students to cite the works of others and to identify the contributions made by those works through the concept of the neighborhood, where the authors are in a community of conversation.

We can compare an annotated bibliography to a neighborhood of buildings. A neighborhood of buildings is something our students are familiar with navigating; they understand why each one needs to be uniquely identified, and why a person would want to know something about each building before entering. A building is also easy to represent visually, in either great detail or in a simplified sketch. So both key elements for a good analogy – available points for comparison,
and audience familiarity - are present, and we can proceed to developing the point-by-point analogy shown in table 1 below.

<table>
<thead>
<tr>
<th>Component of the thing to be explained (Annotated Bibliography)</th>
<th>Component of the analogy (Building)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection of sources</td>
<td>Neighborhood</td>
</tr>
<tr>
<td>Author</td>
<td>Owner</td>
</tr>
<tr>
<td>• Solo, joint, or corporate author</td>
<td>• Sole, joint, or corporate ownership</td>
</tr>
<tr>
<td>Title (article title and journal title), volume and issue number, publisher and place of publication</td>
<td>Street Address</td>
</tr>
<tr>
<td>• Digital Object Identifier (DOI)</td>
<td>• GPS coordinates</td>
</tr>
<tr>
<td>Annotation</td>
<td>Structure</td>
</tr>
<tr>
<td>• Credibility of author</td>
<td>• Foundation</td>
</tr>
<tr>
<td>• Argument</td>
<td>• Walls</td>
</tr>
<tr>
<td>• Conclusion</td>
<td>• Roof</td>
</tr>
<tr>
<td>• Reasons source is of interest</td>
<td>• Architectural features</td>
</tr>
</tbody>
</table>
There are trade-offs made in the infographic in figure 1.
Think of an annotated bibliography like a neighborhood of homes. Each source, like each house, has its own owner, location, and substance that makes a unique contribution to the community. Your citation tells the reader who owns the source and where to find it, and the annotation tells us what's special about that one and its contents.

**The Owner**

The first part of an annotation lists the creator of work. Just like a house can be owned by one person, a family, or a corporation that rents it out, a text, film, or other source can have a solo author, two or more named co-authors, or a corporate or collective author, like a government agency or research organization.

**The Location**

The rest of the citation - the title, journal title, volume and issue number, URL, or publisher and place as necessary - tells the reader how to find the work. Just like an address tells someone how to find a home, some articles have a digital object identifier (DOI), which you list at the end of your citation. The DOI is a precise, stable way of finding a source online, the same way GPS coordinates can clarify a tricky address.

**The Contents**

Start with the foundation: the creator's credibility, or why you would believe them on this topic, in one sentence. Then build the walls, using two sentences to describe the main argument. These build up to the roof, the conclusions drawn by the author - and by you - summarized in another couple sentences. Finally, take one or two sentences to highlight any unusual architectural features - unique contributions or distinctive perspectives in the source.

[Link to source: https://libguides.csun.edu/research-strategies/citing-sources]
Figure 1: Infographic using the analogy of a house to explain annotated bibliography.

Specifically, the individual components of the citation are not analogized to a street address. That could be helpful, but it might limit the applicability of the infographic to a specific citation style or citation of specific types of sources. For the purposes of our specific audience – the University 100 students at California State University – it is better to leave those details out and have more visual clarity. But this is subject to iteration; for a more narrowly defined audience, we might draw the comparison of an article to a street number, the volume and issue to the street name, and the journal title to the city name, for example. (This could help to solve the confusion students often have between article titles and journal titles.)

Another option is to use something that students already do fluently online and apply it to scholarly research. Our students may “live on the internet,” but that does not mean they have ever critically considered its architecture or how different types of content compare.[10] Librarians can build on students’ fluency with streaming media to draw an analogy to library databases, as in table 2 below.

<table>
<thead>
<tr>
<th>Component of the thing to be explained (Databases)</th>
<th>Component of the analogy (Streaming Television Services)</th>
</tr>
</thead>
</table>

In terms of the Framework, this streaming video analogy is mostly focused on Searching as Strategic Exploration, as it explains how a specific type of information system is organized. Additionally, like the annotated bibliography as neighborhood example, the television series analogy also introduces the concept of Scholarship as Conversation, by comparing academic disciplines to fandoms.

The fandom analogy works best with a specific, well-known, long-running television series embedded in a larger popular culture.[11] One version, seen in figure 2 (available http://scholarworks.csun.edu/handle/10211.3/213414), uses the television show Agents of
Agents of S.H.I.E.L.D., which is part of the Marvel Cinematic Universe; the other, figure 3 (available http://scholarworks.csun.edu/handle/10211.3/213414), uses Star Trek: Discovery. Star Trek is a more useful analogy when working with STEM students; they are somewhat more likely to be familiar with Star Trek as a mythos. More importantly for the analogy, in Star Trek the shorter television episodes are central to the canon while the feature films fill out extra details, just as in the sciences most of the research is published in journal articles and books are supplementary. Agents of S.H.I.E.L.D. is a better choice when working with humanities students, because in the Marvel Cinematic Universe the full-length films are the focus and the television shows supplement with minor characters, similar to the way humanities scholarship moves forward in major books, with less emphasis on journal articles. Of course, a true Marvel fan would argue that the comic books are the real creative wellspring; students who raise this issue can be introduced to the analogy of conference papers as the raw material for books and articles.

Prototype

This stage in design thinking process is taking the ideas generated in the ideation phase and crafting an initial design. This could take the form of sketching or producing a scaled down version of the creation, prototyping. Initially, this phase may encounter road blocks that take you back to the ideation stage, and that is to be expected. The design thinking process gives you the opportunity to work through design problems by soliciting feedback throughout the prototyping phase. It is especially important to generate early feedback as to not waste time pursuing an idea not well received.

The simplest and most effective way to begin prototyping an infographic is to sketch it with pencil and paper. This leaves you free to include any kind of content, instead of limiting your
imagination by the options on offer in a given piece of software. It is also easy to share widely for feedback, and helps you avoid getting bogged down in minutia like color choices while you are still in the wireframe stage.

Once you have your analogy and a basic sketch, then you can determine your software design tool. Microsoft Publisher is one possibility that may already be familiar to you; the “Scholarly Articles as Binge Watching” infographics (figs. 2 and 3 available http://scholarworks.csun.edu/handle/10211.3/213414) were both created in Publisher. This software has the advantage of likely already being included on your institution’s bundled package and allowing for easy sharing among collaborators, but it is optimized for print, not screens. There are also free, online tools specifically designed for creating infographics, such as Canva, Piktochart, or Visiliy. The annotated bibliography infographic seen in figure 1 was created in Piktochart. These tools have default settings, layouts, color palettes, and other options optimized for infographics, but the editing is tied to a single user’s account, and the final product will display the website’s name, unless you pay for a professional account.

When creating infographics, be considerate of elements such as fonts, proportions, and colors. Depending on the size of the infographic, try to limit the number of different fonts, make sure fonts are legible, and scaled appropriately, taking into account title size verses subheading content. Fonts have different characteristics and personalities that can illicit feelings from viewers, so choose font(s) that convey the message you are trying to send; “some typefaces appear serious, some are upright and conservative, while others are fun, adventurous and youthful.”[12] Color is also an element that have symbolic meanings and communicate different messages. There are different ways to use color as design elements to make your infographic
harmonize and be visually captivating. Consider looking at resources such as Color Matters,[13] for formulae to create good color schemes and information on color theory.

Infographics generally call for clip art, rather than photographs. If you do use photographs, as in the “Scholarly Articles as Binge Watching” infographics (figs. 2 and 3 available http://scholarworks.csun.edu/handle/10211.3/213414), they should be of specific people, places, or things, and surrounded by plenty of white space. Go ahead and use a photograph of the stacks at your own library, or a specific person to whom you want to draw an analogy, but if you are using a generic example, choose the graphic legibility of a cartoon or clip art. When you do use images of people, be sure (recalling the Empathize stage) to represent the diversity of your audience in ethnicity, age, gender, and size. Our campus is plurality Latinx and a majority students of color, so the Marvel infographic seen in figure 2 has a Latina agent at the forefront of the screen grab, the Star Trek episode seen in figure 3 shows two officers of color (one man and one woman), and even the abstract cartoon in the annotated bibliography infographic in figure 1 could plausibly be read as Latinx.

Accessibility for users with vision impairments and other disabilities is not only ethically right but also legally required for all university materials. The simplest way to make an accessible version of an infographic is to write all the text, plus text that replaces any essential graphics, in plain text format and add it at the bottom of your infographic. But there are also other important design choices that will enhance the legibility of the infographic for users who do not rely entirely on screen readers. For example, students with dyslexia benefit from sans serif fonts with an emphasis on the bottom halves of the letters, especially letters that are frequently reversed like b and d or p and q; if you serve many dyslexic students you may consider a font specially designed for ease of reading by people with dyslexia.[14] High contrast
in colors between background and foreground text is important for ease of reading for anyone, but especially for those with visual impairments. Again, the design process should return to the step of Empathize to consider the needs of all users.

Test

In teaching with infographics, it is helpful to have more examples in mind or ways to flesh out the analogy that would not fit in the graphical space. For example, to return to the annotated bibliography analogy, if I know a specific class is using a specific citation format, I can then unpack how specific components of an address correspond to specific components of that citation format. It is also helpful to have a specific example to take apart with the class and ask them to map back on to the analogy. To use the streaming media infographic, you could show a class an article in a database and ask them which parts correspond to the network, series name, episode title, etc. The more accurate the answers you get from the students, the more you know the analogy has communicated.

Infographics used during teaching sessions can be evaluated immediately after use just like any other component of a one-shot instructional session. If your teaching session uses an interactive software like Socrative or Poll EV to pose questions to the students as you go, you can include a question about the infographic. Similar questions can appear on a traditional pen-and-paper post-class evaluation: “Did the infographic help you better understand what you need to include in your annotated bibliography?” “1) Yes, it really helped! I know what I need to do. 2) It helped some; I think I mostly get it. 3) It helped a little, but I’m still confused. 3) Not at all - I’m even more confused than before. 5) I already understood the assignment before today’s session.”
Infographics, as a fairly small component of an instructional session, lend themselves well to A/B testing. If you gain the cooperation of instructors in a course like CSUN’s University 100, where you have a number of similar sections of the same course, you can compare sections that do and do not use an infographic, or that use two different infographics, on their performance on the relevant assignment, and determine if there is a significant difference in the average grade.

A distinctly important metric for infographics is their performance on social media. Share infographics on blogs, Facebook, Instagram, Pinterest, Snapchat, and Twitter. Look for the number of likes, shares, and pingbacks, and compare them to your more text-heavy content or your photography posts. Similarly, they can be shared on your campus’s course management software; most CMSs will track their use across campus. Infographics take more time to create, but they are more substantively educational than most photographs, so consider both cost and engagement when assessing them.

**Reflection**

Infographics can play a compelling role connecting students with elements of the Framework, promote lively classroom discussions, and be a practical takeaway for later use. They are also an important tool in reaching students who do not have the opportunity for course-specific instructional sessions, via social media. Most students understand they need to cite their sources, but equating a citation to an address of a house might be more memorable and visually compelling in an infographic. Making the connections that a source that is not properly cited is equivalent to a package that does not have the address in the right order – the package won’t be delivered to the right house and the citation will not lead the reader to the correct source. In turn,
students have a better understanding of the knowledge practice “citing the contributing work of others in their own information production” in the frame Scholarship as Conversation.\textsuperscript{15}

Using the design thinking process to develop the infographics is an effective approach which helped us come up with creative works that we can integrate into the classroom and other avenues of librarianship. Consider who your students are (Empathize), how the Framework applies to their course (Define), what analogy will communicate that aspect of the Framework to them (Ideate), how to visually communicate that analogy (Prototype), and how successful your infographic was at communicating the relevant Framework concept to those students (Test).

We have found involving colleagues and students in the design thinking process elevated the design and overall message of the infographic. It is important to solicit feedback at each stage, even if that means going back a phase or two, in an effort to create material that can be used across the library. The Framework is for all students, and your infographics can be for all of your students, too.

Notes

\begin{enumerate}
\item Dam and Siang.
\end{enumerate}


[11] Precisely because of those necessary features of the analogy, the licensing fees of reproducing the copyrighted screenshots and logos of the infographic were prohibitively expensive for this book, but, thanks to the doctrine of fair use, they are available online at http://scholarworks.csun.edu/handle/10211.3/213414.


Bibliography


**Biographies**

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CHAPTER 4

Bridging the Gap: First-Year College Student Information Literacy Misunderstandings and the Framework

By Jillian Collier, Allison Rand, and Lisa Janicke Hinchliffe

Introduction

When designing instruction based on the Framework’s threshold concepts, it is helpful for librarians to investigate what students do not understand about those concepts so that we are able to provide intentional instruction and support, especially for first-year students.

Using predictable misunderstandings as a lens through which to examine the Framework reveals connections between and among the knowledge practices and dispositions, while also revealing key concepts that the Framework presumes but does not present for students. This pedagogical perspective can identify potential gaps in the Framework that require more explicitly targeted information literacy instruction for first-year students. This chapter draws upon previous work that identified perceived misconceptions among first-year students and highlights misconceptions about the library and the role of the librarian, which the Framework fails to directly address.

The Context and Content of the Framework
The Framework for Information Literacy for Higher Education positions itself as responding to “the rapidly changing higher education environment, along with the dynamic and often uncertain information ecosystem in which all of us work and live” and the concomitant need for students to “have a greater role and responsibility in creating new knowledge, in understanding the contours and the changing dynamics of the world of information, and in using information.” These statements underscore the notion that students should have agency as actors in the information environment and that educators should continue the work to shift college curricula away from transmission of knowledge models towards ensuring that all students have inquiry-based reflective learning opportunities.¹

In light of these rapidly changing, dynamic, and uncertain realities, and the focus on the student as information creator, the Framework moves the definition of information literacy away from the familiar process definition of being able to recognize an information need and to find, use, and evaluate information² to an expanded definition that emphasizes the notions of discovery, information production, and social learning settings:

> Information literacy is the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning.³

The Framework seeks to support students in developing these abilities by drawing on core ideas that librarians have identified within their knowledge domain, in particular the threshold concepts as described in the penultimate phase of the Delphi study conducted by Townsend, Hofer, Lin Hanick, and Brunetti,⁴ and by explicating knowledge practices and dispositions to illustrate those concepts.

Since the adoption of the Framework by the Association of College & Research Libraries (ACRL), academic librarians at all levels of higher education have undertaken many efforts to implement the Framework. This is manifest in the scholarly literature, repositories of pedagogical practices, and conferences devoted wholly or in substantial part to sharing approaches and strategies as well as the demand for online and in-
person training opportunities such as the ACRL Roadshow *Engaging with the ACRL Framework: A Catalyst for Exploring and Expanding Our Teaching Practice*.

The Framework calls upon *Understanding by Design* and the notions of essential concepts and questions in instructional design in introducing the Framework. The influence of this instructional design model is clearly evident in “Appendix 1: Implementing the Framework.” Not surprisingly the ACRL Roadshow that is offered by ACRL as well as many other training opportunities also call upon the Wiggins and McTigue “backwards design” model.

Though similar in many ways to other instructional design models, Wiggins and McTigue’s approach emphasizes the value of instructor expertise and experience and the pedagogical knowledge of educators, similar in some ways to the emphasis given to librarian knowledge and expertise of information literacy in the Framework. This expert knowledge of the practitioner is particularly salient in their discussion of learner misunderstandings and the importance of accounting for misconceptions in one’s pedagogical designs.

This chapter draws upon our earlier work, a study to identify first year students’ information literacy misconceptions, which was inspired by the predictable misunderstandings theory of Wiggins and McTigue. From that study we suggested that “correcting misconceptions and establishing a foundation of conceptual understandings may be a precursor to Framework-based information literacy instruction.” In other words, students cannot learn new information literacy concepts until they unlearn their misconceptions. In this chapter we seek to bring the results of that study into conversation with the Framework itself and, in doing so, explore whether the threshold concepts in the Framework might themselves be mechanisms for addressing the misconceptions, or if there are gaps in the Framework that need to be addressed.

**Information Literacy Misconceptions**
According to Wiggins and McTighe, instructors in any learning domain will have developed a sense of the typical errors learners make in that field. They encourage instructors to intentionally engage these errors, which they term “predictable misunderstandings,” and the instructional design process in order to anticipate when these errors will occur and to support learners in encountering their mistakes and developing correct conceptual understandings.

Misconceptions are a particular kind of learner error. As Wiggins and McTighe (2005) describe:

> Learners are not blank slates. They come to the learning situation with prior knowledge, experience, and, quite possibly, some misconceptions. Such misunderstandings, as opposed to confusion or inattention, typically flow from prior experience and a plausible inference based on that experience.⁹

In other words, misconceptions are particularly persistent as misunderstandings because they are founded in the learner’s past experiences of success. Past experiences of success are evidence to the learner that their misconception is a correct conception even though it is not. Students may continue to hold misunderstandings, even when the instructor can identify how the misconception is erroneous, because in the student’s experience, it gave them success. For example, one of the predictable understandings about information literacy that was identified among first-year college students is that they believe that Google is a sufficient search tool for research assignments. This misconception persists in first-year college students if they experienced success in high school when they used Google as a search tool to complete their research assignments.

Librarians with experience and expertise in teaching first-year college students identified ten information literacy misconceptions held by these students, which reflected three thematic groupings of misconceptions (i.e., misconceptions of the library, misconceptions of information access, and misconceptions of the research process) that cause an overarching information literacy misconception.¹⁰ The resulting misconception inventory, grouped by theme, is presented in Table 1.
Table 1.

**Misconceptions Grouped by Theme**

<table>
<thead>
<tr>
<th>Library</th>
</tr>
</thead>
<tbody>
<tr>
<td>First year students believe they are supposed to do their research without assistance.</td>
</tr>
<tr>
<td>First year students perceive the library as only a place to get books or to study.</td>
</tr>
<tr>
<td>First year students believe that all library sources and discovery tools are credible.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Information Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>First year students believe that freely available Internet resources are sufficient for academic work.</td>
</tr>
<tr>
<td>First year students think Google is a sufficient search tool.</td>
</tr>
<tr>
<td>First year students believe that accessibility is an indicator of quality.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>First year students believe that research is a linear, uni-directional process.</td>
</tr>
</tbody>
</table>
First year students think that every question has a single answer.

Information Literacy

First year students believe that they are information literate.

The misunderstandings that first year students bring with them to college must be considered in the instructional design process as academic librarians seek to support students in developing their information literacy skills. Learning outcomes that are intentionally aimed at correcting misconceptions may be part of that process; such learning outcomes are proposed in our earlier work.¹¹

We now also turn to the ACRL Framework to explore whether the Framework itself assists in developing instruction to counter these misconceptions in the high school to college transition.

Finding Corrections to Misconceptions in the Framework

Analyzing our misconception inventory and proposed learning outcomes reveals connections between the misconceptions and the concepts within the Framework. The process of mapping misconceptions to the Framework also revealed that the Framework does not adequately address all of the misconceptions and appears to presume rather than present certain concepts related to student misconceptions. The Framework presents concepts on the nature of information and the nature of research without presenting the concepts of how a library curates information or how librarians can help with research. Since the Framework does not present these concepts as
needing to be taught, it presumes that first-year college students already have some knowledge of the library and librarians. The gap between what is presumed and what is presented becomes particularly evident when using the lens of predictable misunderstandings. Importantly, students are not only missing the presumed knowledge, they actually hold a different and erroneous belief that conflicts with the learning that would be built upon a correct conception.

In examining the misconceptions inventory and possible learning outcomes to counter the misconceptions, we determined that two of the three categories of misconceptions were directly addressed by concepts in the Framework. Misconceptions within the Information Access and the Research Process categories can be addressed in a classroom setting using knowledge practices and dispositions from almost any of the six frames. However, in analyzing our proposed learning outcomes and mapping those outcomes to concepts in the Framework, we revealed a gap in relation to misconceptions regarding the Library. These misconceptions are generally statements about how students understand the library as place and its role in their college experience. While the Framework clearly addresses student misconceptions about information access and the research process, the Framework is silent on issues of the library as a concept and the librarian as an integral figure and resource.

Most of the misconceptions identified in our research can be addressed with instruction based on concepts in the Framework. For the misconceptions regarding information access, learning outcomes were proposed that focus on students’ understanding of the existence of multiple search tools and information sources, the differences between such tools and sources, and the need to evaluate resources used for research. These concepts are significantly addressed by the concepts described in the frames, especially the knowledge practices included in Searching as Strategic Exploration and Authority is Constructed and Contextual. For example, Searching as Strategic Exploration includes the knowledge practice, “match information needs and search strategies to appropriate search tools.” Authority is Constructed and Contextual presents the concepts of different types of authority with the knowledge practice, “use research tools and indicators of authority to determine the credibility of sources, understanding the elements that might temper this credibility.”¹²

Library databases, and their differences from other online search engines, are not explicitly mentioned in the Framework, but the concepts are easily seen in the frames.
Our proposed learning outcomes regarding the research process are aimed at correcting students’ overriding misconception that research is a linear process resulting in a single answer. These concepts are found throughout the Framework, especially in Research as Inquiry and Searching as Strategic Exploration. Research as Inquiry includes the following dispositions, “consider research as an open-ended exploration and engagement with information” and “value persistence, adaptability, and flexibility and recognize that ambiguity can benefit the research process.” Searching as Strategic Exploration includes knowledge practices such as, “design and refine needs and search strategies as necessary, based on search results” and “manage searching processes and results effectively” as well as the following dispositions, “understand that first attempts at searching do not always produce adequate results,” “exhibit mental flexibility and creativity,” and “persist in the face of search challenges.”¹³ These specific examples, along with other concepts presented throughout the Framework, can be used to design instruction that directly counters students’ misconceptions about these topics.

When considering the misconceptions in the category of Library, and how to correct them, we proposed learning outcomes aimed at improving first-year students’ understanding of two things: the librarian and the library. Students need to understand that the library is a place where they can access information and services, and that librarians are there to provide valuable assistance.

Unlike the other categories of misconceptions, the Framework is lacking concepts to guide instruction in specifically teaching about the library itself and the role of librarians. There is only one mention of librarians in the frames. It comes from one of the dispositions in Searching as Strategic Exploration, which states that students who are learning that concept will “seek guidance from experts, such as librarians.” That statement presumes that students already understand the guidance that a librarian offers, without accounting for students’ misconceptions in this area that need to be corrected in order for them to effectively engage with a librarian, and does not address the unique expertise that librarians bring to the research process that is different than what is offered by other experts. There is no mention of the library itself in the frames. Many first-year students perceive the library as simply a place where books are stored, rather than seeing the library as a comprehensive learning commons where they can access many different sources of information and valuable services. The Framework’s lack of concepts about the library and the librarian creates a gap for librarians creating instruction designed to address first-year students’ misconceptions and further their information literacy development.
The Library and Librarian are Missing

As stated in the Introduction, the Framework is made up of “core ideas” that are foundational to the theory of information literacy, and it is for this reason that it is especially notable that the Framework lacks discussion of the library itself and the role of the librarian. After all, what is more foundational to information literacy than the ideas of the librarian and the library? Based on what the Framework currently states are threshold concepts for information literacy instruction, students are taught that authority is constructed and contextual, but not what authority the librarian has and in what context this matters. Students are taught that information has value, but not the value of the library as the institution that organizes and provides access to information. Students are taught about research as inquiry and searching as strategic exploration, but not how a librarian can help them with those tasks.

A generous interpretation of this absence might be that at the college level, librarians assume that students have been taught what a library is and the role of the librarian at an earlier stage of education. However, this assumption is likely to be erroneous; like the Framework, the AASL National School Library Standards for Learners, School Librarians, and School Libraries (2018) also lacks any clear discussion of the role of the librarian and the function of the library. At both stages, it appears it is assumed or absorbed knowledge rather than a concept that needs to be taught. The irony in this is that any librarian can tell you about the times that adults and children alike have asked why one needs a master’s degree to shelve books or asked if they spend all day reading. We experience in our daily professional lives that people do not have an understanding of what a librarian does, but we assume that, within the setting of a school or academic library, this understanding simply materializes. Librarians express endless frustration that other people do not know what we do; however, a review of our learning guidelines reveals that we do not explicitly teach them about our work and our role.

Rather than any formal instruction on the concept of the library and the role of the librarian, students are expected to abstract from their experiences with libraries and
librarians in order to determine what a library is and the role of the librarian. In some contexts, this may be successful. Students with robust school library programs led by professionally educated school librarians, where information literacy and library usage is integrated and scaffolded into classroom curriculum, are more likely to have solid experiential knowledge of what the library and the librarian can do for them. Students with less access to public or school libraries come to college without this experience and therefore lack foundational knowledge about the library and the librarian. Even worse, as seen in Table 1, students not only lack this presumed knowledge, they also hold misconceptions about the library and the librarian.

Strategies to Bridge the Library Gap in the Framework

If first-year students’ misconceptions about the library and librarian are not corrected through instruction, students face a gap in their understanding of information literacy and the development of information literacy skills may be hindered. We see two potential strategies for bridging that gap: explicit (an additional frame) and infused (additional knowledge practices and dispositions for existing frames).

One solution is a new “Library & Librarian” frame for the Framework that would include the concepts of what the library is and who librarians are. A new frame would recognize that the concepts of an academic library and librarian need to be presented to students, rather than presumed as existing knowledge. A new frame would also give guidance for instruction to correct first-year students’ misconceptions in this area.

Another solution is to expand the Framework’s existing frames, knowledge practices, and dispositions to include more language about the library and librarians. This solution is based on the idea that a student could learn about the library and librarians while they are learning other information literacy concepts and that knowledge about the library and librarians is inherently tied to these other concepts.
An explicit Library & Librarian frame would follow the structure of the other frames in the Framework -- with a title, description, knowledge practices, and dispositions.

Title: The Library & Librarian are Useful
Description: The Library is a learning commons that provides access to organized collections of information and provides valuable services. The Librarian is an expert in fulfilling information needs, who provides valuable assistance to experts and learners.
Knowledge Practices: Learners who are developing their information literate abilities . . .

- Identify the library as an integral part of campus-wide learning programs.
- Recognize that librarians select, organize, and provide access to information in a variety of formats (ie, more than books).
- Recognize that librarians provide instruction of information literacy skills.
- Identify librarians as experts in identifying, analyzing, and fulfilling information needs.
- Identify librarians as necessary consultants in the research process.

Dispositions: Learners who are developing their information literate abilities . . .

- Seek the assistance of the librarian during the research process.
- Value the assistance of the librarian during the research process.
- Utilize the library’s collection of information and its services.
- Value the differences between the library’s curated collection of information and other resources (ie Google).

Expanded Frames

Alternatively, the concepts of library and librarian could be infused into the existing frames by expanding the knowledge practices and dispositions to make visible these concepts.

Authority is Constructed and Contextual

Additional Knowledge Practices/Dispositions:

- Recognize the library’s authority to collect and organize information.
- Seek assistance from the librarian when evaluating sources.

Information Value

- Recognize the library’s role in providing access to information.

Research as Inquiry
Seek assistance from the librarian, and utilize the librarian’s expertise to help form questions and access information.

**Searching as Strategic Exploration**
- Seek guidance from the librarian in developing information search and evaluation strategies.
- Recognize the librarian’s expertise to help with brainstorming, searching, and selecting sources.

The strategies -- explicit and infused -- proposed here are intended to bridge the gaps in the Framework that were identified based on first-year students’ information literacy misconceptions. It is also important to note that the implementation of these strategies would follow the same guidelines as the rest of the Framework. The Framework, and these potential additional concepts, are not designed to be prescriptive, but rather to provide guidance and a general outline of threshold concepts for information literacy. These approaches serve as a guide for bridging the gaps in the Framework with regard to the concepts of library and librarian. Filling in these gaps could be beneficial for librarians who are working to implement the Framework in their instruction. Using the Framework as a comprehensive guide to teaching information literacy may be difficult when there are gaps in the student's conceptions of what a library or librarian is. Once those gaps are bridged, the path to implementing the Framework may become clearer and first year students' transition to college smoother.

**Conclusion**

Regardless of whether a new frame is developed entirely or existing frames are expanded, explicit discussion and instruction focusing on the idea of the library and the librarian should be fundamental. Where librarians might now enter an instruction session and ask students if they have been in the library before, librarians might instead ask students what they think the librarian does, and build on those answers to construct a correct and coherent idea of the role of the library and the librarian. Additionally, it is critical that librarians do not accept a student’s “yes, I know what the library is” as a correct answer. There are any number of interpretations of what a library is and the librarian should encourage students to expand and elaborate in order to assess the students’ understanding. Librarians may also communicate these ideas in informal settings such as on social media or in one on one conversations with students. Assessing student knowledge of the library and the librarian may be as simple as a pre-
and post-evaluation. Ask students at the beginning of class about their familiarity with the library and ask them again at the end of class to describe their understanding.

Additionally, it is critical that discussion of the role of the library and the librarian be as intentional as any other discussion that supports implementation of the Framework. Librarians should make no assumptions about what students already know, or what they need to know, and instead construct curricula around their specific student populations. If librarians are not intentional about discussing the library and the librarian, there is a risk that the conversation may be altogether abandoned in favor of “higher level” concepts. However, the role of the library and the librarian is foundational to how students understand other concepts within the Framework, and it is critical that they develop a clear and thorough understanding of the library and the librarian in order to fully develop their information literacy abilities.
The ultimate goal of building upon the idea of the library and the librarian within the Framework is to address fully all gaps in knowledge that high school students experience when transitioning to a college setting. Our study of predictable information
literacy misconceptions revealed a stark gap in understanding of the role of the library and the librarian in first year college students, which resulted in a number of other misunderstandings, including how the research process works and the expectations of the student’s role in college level research. By addressing the understanding of the library and the librarian, we may also address some of the factors that cause first year students to struggle with research assignments, evaluating sources, and plagiarism, ultimately leading to higher retention and success rates.

Librarians have long struggled to have our authority recognized, but we have rarely codified that authority. Through an expansion of the Framework to include concepts surrounding the library and the librarian, we will help learners develop a more full understanding of information literacy, while also asserting and establishing librarians as experts in the student mindset.

Notes


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CHAPTER 5
Using an Integration Planner to Strategically Implement the ACRL Framework

Elizabeth Kamper, Juliet Gray, and Lydia Jackson

Introduction

Library and Information Services (LIS) at Southern Illinois University Edwardsville (SIUE) is currently experiencing rapid change to restructure into a 21st century library. A key element of this change is the reorganization of the entire Instruction Program. This transition was initiated by the Instruction Librarian, who articulated how information literacy instruction initiatives must align with SIUE’s curriculum by using ACRL’s Framework for Information Literacy for Higher Education. These initiatives also facilitated dialogue with library faculty about how to synchronize their individual approaches to library instruction within the academic disciplines. This collaboration led to the development of an ongoing process to create a seamless library curriculum designed to be flexible and to enhance SIUE’s teaching mission and the value of librarianship. To help facilitate the changes to the curriculum, the Instruction Librarian introduced an organizational document to help visualize the ACRL Framework’s effect on instructional strategies and ultimately improve the librarians’ ability to facilitate campus collaborations.

This chapter will detail how an elective ACRL external review jumpstarted a library faculty-wide initiative to document a developing information literacy program founded on current best practices within the profession. Next, the Information Literacy Integration Planner (ILIP) will be presented along with examples of its implementation into a general education program (first year writing) and a professional school (nursing). Finally, the ILIP will demonstrate how to visualize information literacy sessions that scaffold threshold concepts from the ACRL Framework throughout a nursing academic lifecycle.
SIUE’s Library and Information Services (LIS) began a dramatic overhaul of its collections, services, and space after administrative changes. This mid-sized, state funded university was faced with reductions in tenured and tenure-track faculty and staff. Additionally, a flat budget with no opportunities for innovation caused low morale and organizational stagnation. The Interim Dean recognized from the outset that the library needed organizational redevelopment, an external review, and a new strategic direction. These goals required a recognition that library-wide change was essential. In order for the reorganization of priorities and strategic directions to occur, LIS also needed to consider multiple methods of assessment.

The Interim Dean initiated two approaches to organizational development that placed LIS in a position to become a viable 21st century library. Among other initiatives, the Interim Dean was given support from the Provost and the Chancellor to engage in an external review of all areas of the library. LIS faculty participated in the process of selecting the review team from the Association of College and Research Libraries (ACRL) to facilitate the review. A team of two facilitators who have direct expertise in addressing LIS’s specific needs were assigned.

The ACRL reviewers conducted an extensive environmental scan of LIS. One of the seven primary recommendations from the external review report was to develop a more cohesive and integrated information literacy program based on the ACRL Framework. Additionally, the report supported the idea that the library should hire an individual with experience in first-year engagement techniques that would develop a more cohesive library instruction program. When the Instruction Librarian was hired, she agreed with the ACRL report findings and recommended moving from graduate student-led to faculty-led library instruction. The Interim Dean and LIS faculty agreed that there was a need for LIS to transition from using the 2000 ACRL Information Literacy Standards[2] to the Framework.

In response to the primary recommendations provided within the ACRL report, as well as ideas and values that were articulated during an all-staff retreat that the external reviewers moderated, LIS formed a strategic planning working group to draft a new Strategic Plan. Through a process that encouraged input from all LIS faculty and staff
members, as well outside SIUE constituent groups, a new LIS Strategic Plan was
drafted and approved in May 2019.

The first of six strategic directions identified in the plan is dedicated to developing and
implementing a robust Information Literacy Program aligned with General Education
and School Programs by using the ACRL Framework as the foundation for
transformational learning. Library faculty knew that, in order to achieve this goal, they
had to gain a holistic view of their instruction practices, using a cohesive documentation
method that leverages an Information Literacy Integration Planner (ILIP), that would
allow them to align their strategies with the university’s curriculum.

Instruction Initiatives

In summer 2018, the Library hired an Instruction Librarian with the understanding that
this person would possess expertise to re-envision and re-structure the library
curriculum, based on the ACRL Framework. This work included instituting faculty-led
first year instruction and organizing group and individual workshops for library faculty,
centered around the Framework. Subject Librarians, many of whom were not familiar
with the ACRL Framework, had traditionally delivered instruction independently, with
heavy emphasis on database demonstration and lecture-style instruction.

The first initiative toward deconstructing instruction silos required taking ownership of
English 101 and 102 sessions and creating a cohesive base for information literacy
instruction. Although this concept of faculty-led first year instruction is not new to the
field, it was a necessary move that enabled us to start conversations about applying the
ACRL Framework using a general education course as an example. In previous years,
the First-Year Writing Program instruction sessions were facilitated by LIS staff and
graduate assistants who were unaware of the current standards for delivering library
instruction. Transferring the responsibility of these English 101 and 102 sessions to
library faculty members, along with leadership and guidance from the Instruction
Librarian, enabled LIS to better understand the starting point of its Library curriculum.
Additionally, this transfer of instructional responsibility strengthened the connection
between what English faculty were teaching in their own core curriculum and what
library faculty deliver in the instruction session. For example, this shifted the mindset of
English faculty and instructors from viewing library instruction as a syllabus place-holder
to viewing it as an integrated skill-building information literacy workshop. From this
foundation, LIS was strategically positioned to apply the Framework within the academic
disciplines on both undergraduate and graduate levels.
During this transition, the Instruction Librarian designed group workshops to allow faculty to interact with each other as well as the ACRL Framework. These workshops encouraged conversations about a cohesive library instruction program that employs a single voice and encourages a larger group directive. Topics covered included documentation of the current instructional practices, learner-centered approaches, and universal assessments that would allow LIS to understand who its users are, and the role of librarians as educators in a 21st century classroom.[3] Librarians incorporated several self-assessment activities, inspired by Char Booth’s work, that challenged academic librarians to see themselves less as guardians of academic research skills and more as facilitators of information literacy knowledge practices.[4]

The Instruction Librarian also met individually with faculty librarians to document their instruction practices within the academic disciplines and gain an understanding of their strengths and weaknesses as it pertains to facilitating information literacy skills in the classroom. There were three goals for these sessions: the first was to introduce each subject librarian to documentation practices using the ILIP, the second goal was to utilize the ILIP to identify gaps within each librarian’s instructional strategies, and the third was to recognize in what ways subject specific instruction sessions are contributing to the library curriculum. The ILIP allowed faculty librarians to visualize their instructional practices from a constructive and transformative viewpoint. This documentation tool enabled the instruction program to grow and become more transparent using the ACRL Framework as an anchor.

Information Literacy Integration Planner

The Information Literacy Integration Planner is designed to connect library instruction session learning outcomes with the threshold concepts from the ACRL Framework, documenting library instruction sessions as a whole in order to visually map the library curriculum. While there are several books and articles within library literature that articulate strategies for implementing the Framework into instruction sections, literature on the curriculum documentation aspect of this process is sparse. Curriculum documentation as defined by LIS refers to organizing the goals and teaching strategies of each library instruction session, relating those strategies to each other, and operationalizing the Framework. In relation to LIS’s documentation strategies, two articles investigate a similar approach. Baggett et al. uses the Framework to create a
holistic library assessment plan, targeting specific pieces of the Framework to build instruction sessions and service-point assessments.\[5\] The authors mention how curriculum mapping their instruction sessions “will allow [them] to expand their assessment methods to the other five Frames and across all four years of a student’s time...”.\[6\] Whereas the author’s use instruction statistics to gather data about the Framework in upper level courses, LIS is relying on the ILIP for this data collection.

Dubicki conducts a syllabus study to examine campus syllabi for learning outcomes that align with ACRL frames.\[7\] This method identifies how the library can effectively support an institution’s curriculum based on aligning the Framework with faculty-defined learning outcomes. This study also discusses how scaffolding and curriculum mapping are proven strategies to build students’ information literacy knowledge throughout their academic career. Whereas Dubicki is documenting instruction efforts based on campus learning outcomes and the Framework, the ILIP takes this concept a step further by introducing learning objects and student tasks that support the outcomes and frames.

Where the literature is lacking is within the actual curriculum documentation process that leads to successful curriculum mapping. The ILIP answers the following questions:

- What strategies are we implementing that effectively target essential pieces of the Framework?
- How do our specific information literacy instructional strategies align with the research strategies of the university curriculum?
- Does our curriculum mapping tell a story of how library instruction teaches essential core concepts within an academic life cycle?

Defining the ILIP

This organizational tool identifies learning objects, accompanied by student tasks that strategically target the development of research strategies. Once these have been visualized, the final component to the ILIP is the assessment of the student’s information seeking and synthesizing skill levels. The benefits of utilizing the ILIP are threefold: it provides a mechanism for programmatic documentation, uses mapping as a tool for understanding the targeted skill levels of students throughout their academic
careers, and allows for strategic placement of threshold concepts that scaffold information literacy throughout the curriculum.

The ILIP is a documentation tool for instructional practices, whereas the Framework and the suggested rubric language within the ILIP are both measurement tools for success. Essentially, the ILIP bridges together an internal measurement tool (suggested rubric language) and the measurement tools developed through ACRL (Framework) to provide structure and justification for LIS’s instructional practices. There are six parts to the ILIP: Information Literacy Student Level, Learning Outcomes, ACRL Framework, Learning Objects, Student Tasks, and Suggested Rubric Language. These six sections are divided into two separate charts (Figure 1 and 2). The first chart, which holds the Information Literacy Student Level, Learning Outcomes, Framework, and Suggested Rubric Language, act as the theoretical building block of the instruction session or class. The remainder of the sections, which include the Learning Objects and Student Tasks, convey the practical application of the theoretical concepts contained in the first chart. For the ILIP documentation to function effectively, each of the six sections must be developed and accurately defined to provide a realistic snapshot of how an individual instruction session correlates with the Library curriculum.

The Information Literacy Student Level section of the ILIP is used to document the assumed prior knowledge of the students before each instruction session based on the competency level expected in order to successfully complete assignments within a particular course. A rubric was created to organize the knowledge practices and dispositions within the ACRL Framework by academic level: freshman, sophomore, junior, senior (Appendix 1). This rubric provides post-instruction assessment measures for the student level section by establishing four distinct skill levels. Starting the documentation process with the Student Level section sets the tone for the rest of the ILIP by establishing a base information literacy skill level to build upon. For example, if the library faculty members know their instruction sessions are targeting students within a general education course, they are not going to expect those students to synthesize multiple higher order concepts within the ACRL Framework.

The next three aligned sections document learning outcomes, the ACRL Framework, and suggested rubric language. As Figure 1 shows, each row establishes a pattern by articulating a session learning outcome, its relation to the ACRL Framework, and suggesting rubric language based on successful application of core concepts and outcomes. Learning Outcomes are the broader goals of the instruction session and state the instructor’s intentions for student learning. For the purposes of the ILIP, learning outcomes are not intended to explain activities or goals of the teaching faculty member as it pertains to a research assignment. Instead, the ILIP documents learning outcomes unique to the strategies of a library instruction curriculum. These outcomes
provide the primary foundational knowledge necessary to achieve secondary goals required by a teaching faculty member within a research assignment.

The ACRL Framework section, which is located in between Learning Outcomes and Suggested Rubric Language, is the connection between the goals of the instruction session and the larger Information Literacy goals of the library curriculum. Successfully leveraging the concepts within this Framework is essential for providing students with the skills necessary to succeed academically. From a professional perspective, it also standardizes the library curriculum as it relates to the profession as a whole. Understandably so, the ACRL Framework acts an anchor for the ILIP because it is used to justify and measure the instruction practices. In order to do this, a combination of factors need to be considered to effectively pull out specific knowledge practices and
dispositions for a particular Instruction session. For example, library faculty could be informed by consultations with campus instructors, guidance from the aforementioned student level rubric, or any assignments that the instruction session supports. This activity of choosing the appropriate pieces of the ACRL Framework for the ILIP is not an exact science, and requires those teaching library instruction to ask themselves, “What am I actually trying to teach my students?” and “What makes sense to support the curriculum at my specific institution?”

The Suggested Rubric Language section concretely defines the success of each learning outcome within an instruction session. This section, along with the ACRL Framework, are the components within the ILIP that measure whether students have or have not grasped the concepts for which the learning object was designed. When crafting rubric language, librarians need to identify and describe desired competencies using specific, active language. For example, in instances where the goal is for students to articulate or define a specific step within the research process, such as keyword concept mapping, the rubric language would then be, “Students will develop at least 10 keywords using a keyword concept map that accurately define the scope of their research topic.”

The Learning Objects and Student Tasks sections are in a chart, separate from the ACRL Framework and Suggested Rubric Language section (see Figure 2). As mentioned previously, these sections demonstrate the practical application of the theoretical concepts that precede them. The Learning Objects and Student Tasks are the physical items and/or exercises that library faculty members use to teach information literacy concepts. For example, in Nursing 231, which is an introductory nursing research course for students that are being introduced to the major, students are provided note cards with common vernacular of medical terms (example: heart attack) and tasked with identifying the formal CINAHL subject headings for describing those medical concepts (example: myocardial infarction). The Learning Objects, in this example, are the database CINAHL and the note cards used in the activity. By teaching students the task of locating accurate subject headings that match the generally described medical procedure or term, they are being introduced to the discourse of that field, and in turn, the concept of Search as Strategic Exploration. The specific knowledge practice being targeted in this example is “learners who are developing their information literate abilities use different types of search language (e.g., controlled vocabulary, keywords, natural language) appropriately.”[8] There is often overlap between frames, especially when talking about concepts like controlled language and evaluation. The Health Sciences and Instruction Librarians acknowledged that the frame Scholarship as Conversation would also work in this instance; however, the focus was on the knowledge practice that directly supports the learning outcome identified in the Nursing 231 ILIP. The Learning Object and Student Task provide evidence for the
assessment of the Suggested Rubric Language. If students are not completing any task in a library instruction session or course, there is no measurable data for assessment. Thus, these sections are integral to the transformation of library instruction from a demonstration and lecture model to a learner-centered pedagogy.

![Image of ILIP Table]

Figure 2: Second chart of English 205 – Introduction to African American Text, Information Literacy Integration Planner used in Fall 2019 semester.

Utilizing the ILIP

There are several uses for programmatic documentation in library instruction. The specific instances in which the ILIP is found to be most useful are as follows: providing a mechanism for programmatic documentation, using the ILIP as a mapping tool for understanding the targeted skill levels of students throughout their academic careers, and allowing for strategic placement of threshold concepts that scaffold information literacy throughout the curriculum.

Before the documentation phase, as noted previously, the subject librarians at SIUE focused solely on their own strategies and instruction delivery within the academic
disciplines rather than considering Library Instruction as a cohesive program. In the move toward implementing the ACRL Framework and creating a dialog within library instruction, the documentation phase has revealed inconsistencies and methods that do not effectively incorporate the Framework. In addition, a picture has emerged that reveals how the instruction program could be enhanced to better meet the needs of learners and university programs, while also elevating the curriculum in the library.

Using the ILIP as a mapping tool has allowed LIS to document its current understanding of students’ information literacy skill levels within the academic disciplines as well as where additional threshold concepts can be targeted. For example, the Instruction and Health Sciences Librarians understood the need for certain knowledge practices from the frame, Search as Strategic Exploration, to be introduced to students earlier in their academic career and modified the ILIP of NURS 231 to reflect this understanding. The Health Sciences Librarian then used the ILIP to communicate out to the nursing faculty member about the changes in the library instruction session. In this way, the ILIP benefitted the library as a documentation tool, supported the development of new instruction strategies, and acted as a communication tool between the library and campus community. The same approach is being applied to NURS 472 and graduate-level courses with a research emphasis to build upon students’ information literacy skills and scaffold the library curriculum throughout the major.

Examples of Use

This next example focuses on how the Health Sciences and Instruction Librarians utilized the ILIP to document the instruction session for Nursing 231, identify areas for instructional improvement based on the Framework, and assess how the strategies within this session support the library curriculum as whole.

Documentation Phase

The Instruction and Health Sciences Librarians met on several occasions to discuss how this instruction session had been taught historically. The conversation began informally with a discussion about how the Health Sciences Librarian delivered content and the expectations for student interaction during the session. Once the learning outcomes of the session had been clearly identified, they discussed which concepts within the ACRL Framework were being applied.
Development Phase

During the Development Phase, the librarians took a critical approach while discussing how the learning objects and student tasks should support the learning outcomes and ACRL Framework. They realized there were untapped opportunities for student engagement to better facilitate active learning in the classroom and worked together to develop student tasks that focused specifically on the knowledge practices associated with the targeted learning outcomes.

Assessment Phase

After the Health Sciences Librarian applied the active learning elements of Nursing 231, the librarians met again to discuss how this instruction session supported the library’s curriculum as a whole, particularly as it pertains to nursing. They identified how this course introduced several information literacy skills and were able to place learning outcomes in higher-level nursing courses that enhanced that prior knowledge.
Figure 3: First chart of Nursing 231 – Examination of Role of Professional Nurses, Information Literacy Integration Planner used in Fall 2019 semester.
Using the ILIP and the Student Level Rubric, librarians at SIUE can visually map their curriculum. By examining what threshold concepts from the Framework are being targeted at every level, librarians also identify frames that are not being targeted in disciplines at various levels throughout an academic life cycle. As illustrated in Figure 5, identifying gaps is essential to the growth of the library’s involvement in scaffolding information literacy skills throughout the university’s curriculum, because it allows librarians to assess their own effectiveness at teaching the threshold concepts within the Framework. This step in the process acknowledges the librarian’s role in educating students on the research process over and above point-and-click database demonstrations, which provides increasing opportunities for library and outside faculty
collaborations. It also provides recognition that the library faculty member is a crucial partner in teaching faculty’s efforts to educate students about the research process within the disciplines.

As we examine the skills map in Figure 5 created from the frames used while documenting the nursing library curriculum, it is evident that Search as Strategic Exploration is the most common frame. The only frame that does not appear in the Nursing curriculum is Information Has Value; however, this is one of the most common frames addressed in the Humanities/English curriculum, which all students are required to take. As librarians, we cannot guarantee that each Nursing, English, or STEM class participates in library instruction; however, using the ILIP and skill maps helps ensure that we are providing broad curriculum based on the ACRL Framework.

![Information Literacy Skills Map of Nursing Curriculum using English 102, Nursing 231, Nursing 472, and Nursing 604 showing the ACRL frames targeted in each instruction session.](image-url)
Limitations and Future Aspirations

While the ILIP assesses gaps in instruction and identifies areas for growth, outside expertise and effort is required to constructively fill these gaps. In this way, the ILIP is a great partnership tool between subject-specific librarians and instruction librarians who can both bring their expertise to delivering library instruction through the Framework. Another limitation of the ILIP is, while this tool can capture the justification for applying certain concepts within instruction, it is not a tool for gathering comprehensive instructional data such as student count, number of sessions, etc.

Looking forward, LIS faculty would like to use the ILIP to document an instructional history. By establishing current instruction practices and strategies, librarians will be able to transfer their instructional knowledge to new librarians who are hired by the institution. Not only will future hires understand the instructional approaches applied in the classroom, they will also be able to recognize why specific methods were chosen by examining the learning outcomes and their relationship to the ACRL Framework. In addition to this internal goal, if LIS can document its overall impact on student success throughout an academic lifecycle, future campus collaborations are more likely to occur. Librarians hope that by fully capturing the impact of library instruction, justification for a future credit-bearing library curriculum will be available.

Notes


3 Instruction Materials | LIS Internal Use. https://libguides.siue.edu/ILmaterials


6 Ibid.


**Bibliography**


Biographies

Elizabeth Kamper is an Assistant Professor at Southern Illinois University – Edwardsville and serves as the Instruction Librarian at Lovejoy Library. Kamper leads first-year information literacy instruction efforts in partnership with the First-Year Writing Program. Her current research interests include media literacy in first-year students, student-centered pedagogy in library instruction, as well as leveraging the ACRL Framework to institute programmatic change in libraries.

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Lydia Jackson is an Associate Professor and the Interim Dean of Library and Information Services at Southern Illinois University – Edwardsville. She has been active in the library profession for over 20 years, holding progressive positions in reference, instruction, and administration. Jackson has been actively engaged in local, state, regional and national library organizations, and has participated in the ACRL Immersion Program. She has published in the areas of library instruction, information literacy, high school library partnerships and assessment.
INTRODUCTION

One goal of music information literacy education is to produce an informed practice and performance. In contrast to some of the highly objective scientific facts and methods of other disciplines, information literacy interacts differently with music education. As an element of the preparation process and a means to an end, it is often overlooked by developing musicians. We begin this discussion with the question: How can music and information educators visualize concepts from the ACRL Framework for Information Literacy for Higher Education to explain nuances in research and its value in musical performance to their students? This chapter discusses recurring instructional concepts in the discipline, methods of drawing visual connections to music education, and specific visuals applicable to the classroom.

VISUAL MECHANISMS

Visual images and metaphors provide an inroad for understanding the nebulous intangibilities of the research process. Whether intentionally called out or crafted, we apply metaphor or
metaphorical scenarios to music discussions all the time. They provide both a natural and necessary description, which allows us to participate in conversations about the context and performance of music. For example, we can play smoothly, moderately, playfully, vigorously, accessibly, and so much more. These descriptions represent “how” we play, the performance language (e.g. Allegro, Grave) acts as a vehicle by which we conceptualize the experience and follow the composer’s direction or intention. Metaphors provide a method of being. They allow us to describe an experience in other terms. For example, if we can relate the feeling of velvet to “smoothly,” we have another mode of conceptualizing how that might feel musically. These terms provide mechanisms for understanding tangible experience to new concepts and ideas. Formally recognizing the role of metaphors in visual explanations gives way to using them more intentionally through visuals and the visual itself is a form of metaphor. The visual represents an idea, knowledge practice, or disciplinary practice. What we choose for those visuals is not simply symbolic. It sets the frame in which we experience our learning. Visuals presented in this chapter target common concepts and topics covered in music information literacy, the ACRL frames they represent, and their connection to the knowledge practices they encourage.

**AUTHORITY IS CONSTRUCTED AND CONTEXTUAL**

The concept of authority behind the frame of Authority is Constructed and Contextual has existed in the music realm long before the ACRL frames were adopted in 2016. [1] Tracing authority in order to evaluate it within this discipline is more complicated than fields that rely on annotated articles. Sources are not often cited in an extensive bibliography at the end of a performance program. However, musical influences construct a performer and their performance. Instructors, scores, recordings, feedback, and peers all contribute to a
performance. The frame Authority addresses evaluation with, “resources reflect their creators’ expertise and credibility.”[2] Within music, “resources” can include scores, performances, recordings, professional works, and other compilations. As art forms, each of these resources can be evaluated objectively or subjectively and separating the two is challenging to novice learners.

As defined by the Framework, the term context in the frame Authority Is Constructed and Contextual centers on the information needed. Within music, the context of this information need and required authority varies within the discipline. Looking at context from a music history perspective, the level of authority needed to fulfill an information need is very similar to other disciplines. As with other novice information literacy students, music students can turn to peer-reviewed papers, books, lectures by experts in the field, and other typical examples of scholarly or popular resources with traditional indicators of authority. These sources may fit the context for a historian, but not always for music performance or composition research. Recognizing influences in the final performance and those influences within a historical context allows us to understand their value and credibility.

Another element of this frame reads, “Authority is constructed in that various communities may recognize different types of authority.”[3] Discussions of music authority require students to identify how authority is recognized, understand their own authority, and their place in the larger network of musicians. Being able to visualize music, artists, and performances within a larger network of associations clarifies where they belong in the web of musicians that make up this discipline.

This intersection of musical influences is where the relationship between the frame of Scholarship as Conversation comes into dialog with key elements of Authority is Constructed
and Contextual. Much of music education was founded on European principles, and a major model was the Paris Conservatory. Musicians today are still learning from method books published by past Paris Conservatory teachers and performing pieces written as graduation exams. A musician’s place within the greater web of musicians can determine their use of vibrato, type of articulation, tone quality, even the selection of an instrument. When discussing why someone is considered an authoritative source of their instrument, having students trace their musical lineage with a web of primary music instructors or informal music influencers can help them visualize the construction of authority. Can they trace their lineage all the way back to a Paris Conservatory instructor? Why are these associations seen as contributing to their authority as a performer or educator? Understanding a network of musical influences is complex and students benefit through visual explanation.

Contextualizing authority within an information need as part of the frame Authority is Constructed and Contextual can be difficult to determine if students do not understand how intricately and interwoven music and musicians can be. Depending on their information need, the web of connections may change. As in all disciplines, musicians also dispute authorities. Understanding how the appropriateness of a resource changes based on need is worthy of student attention.

**INFORMATION CREATION AS A PROCESS**

The frame of Information Creation as a Process recognizes that the process is what shapes and helps determine the product. In music, this is what creates space and recognition for practice to be a part of the performance. As with layers of authority, it is the layers of practice and attention to the various areas of a musical piece that develop it and create the ultimate performance. While the equation of more practice equals better performance may seem obvious, putting it in
terms of valuing the process in creating a product can give those tedious hours of practice new significance and credit.

Knowledge practices in this frame also serve to unite objective technical skills with creative musical choices. While objective components are primarily a reflection of a student’s technical knowledge, subjective components are creative decisions. This frame articulates that “Information in any format is produced to convey a message and is shared via a selected delivery method.”[5] Students can start to see how technical skills, creative interpretation, and mechanisms of performance are part of the ultimate performance message and feeling. Delivery is part of the performance, and practice and research are part of the delivery.

While an examination of the frame Authority is Constructed and Contextual looks at music history, performance, composition, and education as benefiting from separate methods of interacting with information literacy, the frame of Information Creation as a Process can be applied more generally to all these areas. From the mindset of the process, it is the coming together of these musical elements that create the final performance. For instance, all music students are part of the performance whether they are performing, writing instructions for the performer, or guiding and directing a performance—at various levels, they all had a hand in its production. Because of this, Information Creation as a Process accounts for the combined benefits of these sub-disciplines by recognizing the role of all musicians in the product.
VISUALIZING THE FRAMEWORK IN ACTION

The images provided in this section are intended to simplify and help explain nuances in music information literacy education. Each visual aims to explain and provide representation for students to more easily grasp complex concepts within the discipline.

Visual Concept 1

Frames: Authority is Constructed and Contextual; Scholarship is a Conversation

Knowledge Practices:

- understand the increasingly social nature of the information ecosystem where authorities actively connect with one another and sources develop over time.

- recognize that a given scholarly work may not represent the only or even the majority perspective on the issue.

- understand that many disciplines have acknowledged authorities in the sense of well-known scholars and publications that are widely considered “standard,” and yet, even in those situations, some scholars would challenge the authority of those sources. [6]
A cosmos represents a system of relationships. Stars, planets, asteroids, and space particles relate to each other and represent the proximity of relationships. While physics is reality’s explanation for why planets associate, this image represents a parallel to how music performers interact and connect. While planets are not social in any literal sense, they do relate in a way we could compare to an “information ecosystem where authorities actively connect with one another and sources develop over time.”[7] Emphasizing the general concept behind a cosmos is important and can help students see relationships. While not expressed in this image, another discussion to have with students is to emphasize that like continuing debates in science to
explain elements of the universe, there are continuing debates in music and a “given scholarly work may not represent the only or even the majority perspective on the issue.”

This is where the frame Scholarship as Conversation comes into dialog with key elements of Authority is Constructed and Contextual. Visualizing a cosmos of performers allows students to see how authority is built and requires a context. Galaxies are created from the relationship of planets, stars, and solar systems and their position in a solar system make them more specialized. Visualizing various authorities in relation to each other illustrates how scholarship is a connected conversation.

An interactive visual tool to use as an example to illustrate “the increasingly social nature of the information ecosystem” within one galaxy of the musical cosmos is Linked Jazz (figure 2). The resource allows students to see how musicians connect and intersect within the cosmos of relationships. There is no singular direction and musicians performing with each other create a mutual influence. These connections not only help students visually understand social influences in the music profession but also look for divergences where musicians did not connect or perhaps agree. Also highlighting that new voices enter all the time can allow students to visualize themselves in the context of a larger, ongoing conversation. In this way, the frames of Scholarship as Conversation and Authority is Constructed and Contextual work together to explain the complex information ecosystem.
Visual Concept 2

Frame: Authority Is Constructed and Contextual

Knowledge Practices:

- define different types of authority, such as subject expertise (e.g., scholarship), societal position (e.g., public office or title), or special experience (e.g., participating in a historic event)

- recognize that authoritative content may be packaged formally or informally and may include sources of all media types

- understand the increasingly social nature of the information ecosystem where authorities actively connect with one another and sources develop over time.
A student is assigned an orchestral excerpt; a brief solo from a major work used as audition materials for educational and professional ensembles. They first find the sheet music in an orchestral excerpts book for their instrument and then find a video of a top performer providing commentary then playing the excerpt. At first glance, they seem to have fulfilled their duty of properly researching to prepare the music, but they have not taken into account the different types of authority and how they interact with each other.

The first oversight is the student’s selection of only an excerpt book. Excerpt books only contain the solo part and only the section of music to be studied. This takes away the excerpt’s place in the context of the overall piece. What instruments are accompanying the soloist? What occurs musically before and after the solo? What is the overall intention of the piece? By not considering questions like these to determine the extent of their information need, students are not recognizing the authority of the musical work itself.

The next oversight is finding a video of a top performer providing commentary then playing the excerpt. Similar to selecting only an excerpt book, the student is taking the performance of the solo out of context. While they are recognizing authoritative content, a highly skilled musician, informally packaged in a YouTube video, they are again not placing the solo in the context of the piece and are overestimating the authority of one person believing it is the only way to perform this excerpt.

To better communicate the wider range of authoritative sources to fulfill their much broader information need, students must first understand the different layers of authority in play. Each planet within the musical cosmos has different layers of authority that fit within and influence the others. Instead of layers such as the crust, mantel, and core, there are layers of the individual player, ensemble, piece, and composer (figure 3).
In the orchestral excerpt example, the foundation is formed by an individual player’s unique set of qualifications, experience, performance capabilities, and individual tone preferences along with their individual solo part. This is the level of the excerpts book and recording. Their authority is nested within the authority of the ensemble who introduced, accompanied, and concluded their solo. This is the level of a full orchestral score and a recording of the excerpt with the full orchestra. The authority of the ensemble is nested within the authority of the overall piece. What was the intent behind this specific piece? What is the form? Is the excerpt a repeated melody from a previous movement? This is the level of multiple full-length recordings. To best understand a single piece, the authority of the composer encompasses the authority of
the piece. Who composed this piece? When did they compose it? Were there any specific events that may have influenced its composition? Is the composer known for using a specific compositional technique? This is the level of a composer's biography, notes on the score, program notes, reviews, etc.\[11\]

Just as the chemical composition of each layer of the planet can be evaluated and categorized, the evaluation of authority layers can be separated into two essential categories: objective and subjective. Objective components of a piece or performance are visual. They can be found in the notation documented in the music score. Did the performer play all the written pitches, rhythms, dynamics, tempos, color changes (e.g. *dolce, con fuego*), etc.? Did the composer follow the music theory rules associated with that style of composition? In comparison, subjective components of a performance are auditory. They are not found explicitly written in the score and are evaluated on the conviction behind them. These elements may be implied by certain notations (e.g. *ad lib.*, freely), style considerations, or historical performance practice or added by the player due to personal preference.

“Information resources [such as scores and recordings]... are evaluated based on the information need and the context in which the information will be used.”\[12\] Because evaluating plays such a critical role within this frame, it is important for students to understand the category of evaluation they are employing, objective or subjective, and whether it is appropriate to use that category of evaluation for their information need. If a teacher asks a student to find a recording of their favorite interpretation of a piece, this would fall in the subjective evaluation category. Some may argue for other interpretations as better suited to the style of the piece or the time it was composed; however, an interpretation is beyond the objective notation written on the page and is in the subjective realm of inflections made depending on the player's
preference. If a teacher asks a student to find the most technically perfect recording of a piece, for example, this would fall in the objective evaluation category because there is limited to no personal opinion in assessing performance accuracy based on what is written in the score.

These examples are simplifications of music research. The appropriate category of evaluation is rarely either objective or subjective in upper-level undergraduate research, but a combination of the two. Having a discussion to clarify the different categories of evaluation as they pertain to each layer and finding the balance between the two according to the research need will help students become more aware of their research process. Once they understand their process, they are able to see areas they can improve upon. It can also help them move beyond a single-authority mode and become "experts [who] recognize schools of thought or discipline-specific paradigms."[13]

**Visual Concept 3**

Frame: Information Creation as a Process

Knowledge Practice:

- articulate the traditional and emerging processes of information creation and dissemination in a particular discipline.
The simple concept here is input influences output. “Traditional and emerging processes of information creation”[14] are visible through how we find and select music, research historical context, and receive feedback. Our performance is part of “dissemination in a particular discipline.”[15] How we perform a musical piece, articulate its historical context, interpret the score, and reflect on the work of other performers goes into recognizing the process. For example, a musician playing a piece by J.S. Bach must be able to identify the technical notes and rhythms within a piece; however, they must also recognize that music from the Baroque era typically lacks notations indicating articulations or ornamentations. These elements are added in by the player according to specific traditions. In this way, a performance is a homage to music history.

Baking, cooking, and other food production analogies can serve as a productive point of comparison for illustrating the process and what goes into producing music. Figure 4 of a mixing bowl functions on the assumptions of baking or cooking that require combining ingredients together to create the ultimate product. The components on the left are a recipe for a
performance; a method of illustrating Information (Performance) Creation as a Process. The result, whether a cake or a recital with a well selected program and accompanying program notes, can vary depending on how well the recipe was followed. It can be updated or modified to improve its process as the creator (student) develops their information literacy and musical performance skills. Having students create their own Recital Recipe can help them reflect and visualize their current process and find parts of the process that can be improved or updated.

The instructions given for the Recital Recipe exercise are intentionally left vague because this is a chance for the students to verbalize and visualize what their current process is. To implement, instructors can explain what the desired product is, then tell students to write down each step in their process with a visualization or doodle of that step and list any tools they might use to complete that step. This first attempt is to see their current process, not what they think their process should be. Have students share their processes pointing out the different strengths of their machines or share the included version of the Performance Recipe. After an instruction session on available resources and the research process, have the students update their Performance Recipe and share what changes they made. Remind them that the creation of a performance is a process, but so is the creation of that process.

**Visual Concept 4**

Frame: Information Creation as a Process

Knowledge Practices:

- recognize that information may be perceived differently based on the format in which it is packaged.
The information creation process of a musical performance can be described in terms of its proximity to influences. In the example of “Jolene,” the original piece was written by Dolly Parton. However, it has been covered by many artists and each adds their own interpretation. In this way, “information may be perceived differently based on the format in which it is packaged.”[16] In comparing performances of “Jolene” by Alison Krauss versus The White Stripes, one can argue Krauss’s version is much closer to Dolly Parton’s original version. Krauss lists Parton as one of her collaborators on her website and this proximity contributes to a circle of influencing artists that can be heard in her performance of “Jolene.”[17]

Visualizing musical influence through the evolution of a song creates a structure for understanding the context of a musical piece and its creation. This graphic represents a timeline of a few covers to the song “Jolene” with separate instances of it in 1976, 2008, and 2017 (fig. 5).[18] Olivia Newton-John’s version in 1976 has the potential to influence the 2008 version and
both are arguably closer interpretations of Dolly Parton’s version than “Diane” in 2017. The continuous lines represent direct influence and the dotted-line arrows represent space for influence, regardless of whether it’s documented. Performances represent unique, separate instances of a piece and each instance represents an evolution of stylistic choices, timing, instrument of choice, composition of the ensemble, and many other factors that go into creating a performance. Looping back to the idea that songs may be “perceived differently based on the format,”[19] each version may appeal differently to individuals and give a different meaning to the song.

CONCLUSION

While the relationship between musical performance and information literacy can be rather nebulous, visuals and metaphors using the cosmos, networks, cooking, and evolution can aid in clarifying these relationships. Within music, developing knowledge practices from the frame of Authority is Constructed and Contextual means understanding how the context of an information need influences what information you choose, the social and relational nature of music influences, and that authority depends on the information need and is not always consistently agreed upon. Examining the frame of Information Creation as a Process is especially valuable within music information literacy education because it recognizes how the package, or performance, influences how it is perceived. It also grants value and recognition as part of the process to the hours spent in practice and on creative interpretations.

Recognizing that these images and metaphors resonate differently with different audiences, instructors should expect varying degrees of responsiveness from students. Visuals presented in this chapter are intended as examples that allow students to participate in and conceptualize
music information literacy. However, they should be interpreted as representations and students should recognize them as incomplete representations of a complex concept. Any visual representation is just that, representative. They can simplify theory and help students process information, but they are not comprehensive.

Considering, developing, and employing visuals in music information literacy education can also make us more reflective and creative as teachers. When we describe a musical piece, how do we do so? What do they highlight about the process? Thinking intentionally about the figurative language and visuals we employ is not only an effective method of encouraging reflective learning in our students, but it can also help us be more reflective and intentional teachers.

Notes


[2] Ibid.

[3] Ibid.


[6] Ibid.

[7] Ibid.

[8] Ibid.

[9] Ibid.


[11] This is a traditional construction of authority with an emphasis on the musical object (the score) and its creator. For information on this view and others, refer to Christopher Small, *Musicking: The Meanings of Performing and Listening* (Middletown, CT: Wesleyan University Press, 1998).


[13] Ibid.
Ibid.  
Ibid.  
Ibid.  
ACRL, Framework.  

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Biographies

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Elizabeth H. Brown is an Associate Professor at Central Washington University where she oversees library instruction and coordinates the undergraduate program in Library and Information Science. Her research includes instructional theory and practice, changes in library science training, reference services, and figurative language use in teaching. Publications related to this chapter topic include her book, *Learning Through Metaphor: an introduction to metaphors in information literacy*. She has published and presented her research for regional, national, and international audiences.
CHAPTER 7

Envisioning Scholarly Conversations: Fostering Interdisciplinary Transference in General Education Information Literacy Instruction

Julie Arensdorf, MAT, MSLS

Introduction

What does it look like to make the system of scholarly conversation visible as an instruction librarian? And how can this effort serve undergraduate students in particular? The practices of critical pedagogy provide a framework and perhaps even an imperative for making the underlying structures and systems that shape the exchange of scholarly ideas visible for students. Students who share identities with groups that have been and continue to be excluded from higher education frequently encounter systems and processes that serve as gatekeeping devices for those who are unfamiliar with the norms and practices required to engage with these systems. And so, libraries, as both repositories for and stewards of information in all its various formats, are inextricably linked to these same systems in higher education. As Arch and Gilman note in their review of library services for first-generation students, “libraries must ensure that their services and resources are helping students navigate their academic requirements, not presenting a challenge as other institutional structures do.”[1] How then do libraries in specific, and academia more broadly, make underlying systems transparent for students? Within library instruction more specifically, how do we support students in understanding the fundamental systems that are at play when we talk about scholarly conversation and the exchange of ideas? By developing engaging, active learning opportunities and highlighting interdisciplinary connections, library instruction can play a key role in illuminating the complex systems that shape the exchange of ideas.
For the purposes of this chapter, I will assume the reader has a general familiarity with some of the principles of critical pedagogy. There are many excellent introductions to this as a theoretical grounding for library instruction (see for example Accardi and Accardi, Drabinski, and Kumbier), [2] so I will not summarize them here. I am also making the assumption that the reader is open to critical pedagogy as an instructional practice, since it provides a foundation for the approaches that I will later describe. In addition, this chapter will make frequent reference to the ACRL Framework for Information Literacy for Higher Education,[3] with a particular focus on the Scholarship as Conversation frame. Intertwined with this, the chapter will address the principles of metacognition and active learning and how they relate to the idea of making systems visible and support for transferring skills across disciplines. Finally, I will share one approach that puts the above ideas into practice in support of bridging theory into praxis.

Literature Review

Even if one supports the aims of critical pedagogy, it can be challenging to embrace as a day-to-day practice given many of the logistical constraints of library instruction. As McCartin and Dineen note in their exploration of critical-inclusive assessment practices, “time constraints and expectations of discipline-specific teaching faculty can disproportionately influence the pedagogical decisions of a critical information literacy librarian.”[4] One primary constraint library instructors face is the time allotted in a one-shot instruction session. Although many librarians are providing support for courses through online tutorials, guides and videos,[5] and librarians are increasingly supporting courses through blended instruction,[6] the majority of face-to-face library instruction still operates within the confines of one or two (one-shot) instruction sessions, as opposed to semester-long courses. While recent comprehensive statistics on types of library instruction are challenging to find, Cohen et al. found in their 2014 survey sent to librarians at 691 institutions, that only 19% of the responding institutions offered a credit-bearing information literacy course taught by librarians.[7] This is a relatively small percentage compared with the 94% of institutions that offered instructor-requested sessions. Similarly, a review of 14 peer and aspirational institutions by librarians at Idaho State University revealed that while seven of these institutions offered for-credit information literacy courses, the majority taught only one for-credit course and upward of 200 one-shot IL workshops.[8]

These findings align with my own experience at institutions large and small, and observations when connecting with colleagues at other academic libraries, that the majority of face-to-face library instruction still occurs within the one-shot model. The time constraints presented by one 50– or 75– or even 90-minute class period can make it challenging for even the most conscientious instruction librarians to address all of the learning outcomes, assessment
requirements, and instructor requests, let alone design instruction within the overarching liberatory aims of critical information literacy. That is not to say it isn’t possible or important to try, but merely to acknowledge that this can be a daunting undertaking.

Within this context, perhaps it is no surprise that teaching librarians have sometimes struggled to fully embrace the ACRL Framework for Information Literacy for Higher Education.[9] While the previous Information Literacy Competency Standards for Higher Education[10] provided relatively straightforward learning outcomes, the Framework—as a matter of pedagogical philosophy—intentionally resisted prescriptive outcomes, recognizing that when it comes to threshold concepts, learning is almost never a tidy, contained affair, but rather transcends the boundaries of one-shot instruction sessions.[11] The Framework, rather, functions as a grounding pedagogical lens through which to develop learning outcomes for particular institutions or individual information literacy workshops.

While the Framework adopted a wholly different approach to describing information literacy, some of the frames were more closely tied to the previous Standards than others, as was noted when practitioners attempted to ‘translate’ or map the two professional documents. For librarians who taught using the previous Standards, those frames which resist a one-to-one translation from the Standards can be the most challenging to implement. Of note, Leeder Reed in an article which pointed out the particular challenges for 2– and 4-year colleges, identified only one Standard (3) and Performance Indicator (6) which clearly mapped to the Scholarship as Conversation frame.[12] Indeed, this hesitancy to fully embrace the Framework appears to be reflected in the literature, as searches for each of the respective frames in relevant article databases yield meager results despite four years since its formal adoption.

So how does one address an abstract concept such as Scholarship as Conversation within the limits of a one-shot instruction session? And given the myriad constraints and learning outcomes competing for the attention of instruction librarians, why is this frame in particular worth considering? Finally, what is at risk if we do not address this frame? By integrating learning outcomes and teaching strategies that render the systems of scholarly conversation transparent in one-shot information literacy sessions, we can support the nature of threshold concepts as requiring ongoing and scaffolded learning, and support students from diverse backgrounds in more fully engaging in scholarly conversations.

To properly ground this discussion, I will review some of the pedagogical theories used to situate the Framework. As a teaching librarian, I find that the concept of metacognition is especially useful in the context of addressing the Scholarship as Conversation frame. Metacognition refers to ‘one’s awareness of thinking and the self-regulatory behavior that
accompanies this awareness.”[13] When learners are empowered to think about their thinking—to consider those structures that inform their learning—they are better able to name and disrupt structures that might be impeding their path. This method of self-referential thinking can be modeled by instructors through activities and opportunities for guided reflection. As Scott notes, “By demonstrating question-posing and making our own metacognitive processes more transparent to students, librarians can help learners comprehend and see beyond the constructs of platform and format.”[14] Given the foundational, information-architecture role of our profession—one of organizing and providing access to systems of knowledge—the field of librarianship is particularly well-placed to address metacognition with students, especially in interdisciplinary contexts.

The value of metacognition can extend beyond organizing principles, to systems that are also used to exclude. Within scholarly communication, for example, understanding the systems that have excluded the voices of scholars who identify as people of color, members of the LGBTQ+ community, and scholars outside of the U.S. can help to contextualize the relative dearth of resources from these communities when conducting research. For students who share these identities, this frank acknowledgement can also serve to legitimize similar experiences of exclusion, while elucidating the structures that perpetuate these experiences. While not sufficient, the act of naming itself can be necessary and powerful.

Metacognition is especially important when supporting students in applying information literacy skills they learn within one discipline to another. When learners understand the underlying structures that shape scholarly communication within a given discipline, and possess the language to describe this, they are more readily able to apply those principles to other disciplines, especially when practice for this transference is explicitly supported in the classroom. In the examples below, applications of this principle will be shared within the context of a general education course.

Metacognition, while identified as a foundational concept within the Framework, requires explicit support and intentional inclusion in lesson plans. As Fulkerson, Ariew and Jacobson note, “many of the dispositions and self-assessments provided in each frame do not directly address the role of metacognition in the ‘scholarship as a conversation’ concept, yet they ask learners to view themselves differently, as scholars rather than students, who can contribute to a discourse community and reflect on how scholarly conversations occur.”[15] This bridging concept is not self-evident; it must be carefully and intentionally integrated into instruction.

In some ways, learning about scholarly communication is similar to learning a language—once one understands the underlying structures of a language (grammar, syntax, verb conjugation),
one can apply these foundational understandings to new contexts. Similarly, when the structures and features of a given discipline’s scholarly communication landscape are made visible, and these features are tied to the specific characteristics of a given discipline, students are better able to understand the context-dependent nature of scholarly exchange. Given the interdisciplinary nature of libraries, with a bit of effort, libraries are in a unique position to support the transference of this knowledge across disciplines. Similarly, an additional pedagogical principle which plays an important role in the examples shared below, is active learning.

While definitions vary, especially across academic disciplines and schooling levels, writ broadly active learning refers to “instructional activities involving students in doing things and thinking about what they are doing,” as opposed to traditional lecture or transactional methods of instruction.[16] Many teaching librarians are engaging more with active learning strategies, perhaps especially in response to the Framework. For example, Bauder and Rod in their review of critical information literacy and the framework bring attention to several pedagogical approaches which allow students to ‘eavesdrop’ on existing scholarly conversations, and to practice entering the conversation utilizing the Graff and Birkenstein “they say/I say” model of writing.[17] These opportunities for students to actively engage with, play with, or mimic scholarly conversations support students’ growth in moving from novice to developing researchers.

Interdisciplinary General Education Course Example

To illustrate one possibility of what this can look like within library instruction praxis, I will now share two examples of how I have applied the complementary principles of metacognition, active learning, and support for transference within the Scholarship as Conversation frame in my own teaching. Specifically, I will share my approach in teaching multiple sections of a high-enrollment course that fulfills a general education requirement at a large, public university. This general education requirement, referred to commonly as Communication-B, is the second in a series that fulfill a communication learning outcome, with a focus on writing-across-the-curriculum. There are courses in a variety of disciplines that address this requirement, and so library instruction for these courses tends to be situated within the research practices of each individual discipline.

As part of a programmatic effort to assess library instruction within general education courses, I led a working group comprised of instruction librarian colleagues on a collaborative effort to
identify learning outcomes that would be taught and assessed within courses that meet the Communication-B general education requirement. The learning outcomes we developed needed to be broad enough to address courses from disciplines as diverse as Chemistry, Psychology, and Scandinavian Studies, and still be specific enough to inform outcomes for an individual library instruction session. We began by first identifying learning outcomes we had previously addressed within our own individual courses, and then identified areas of overlap. Although we initially had concerns that there would not be many points of convergence given the broad range of courses, we were pleased to discover that many of us were already addressing the same core outcomes, just through the lens of specific disciplines. After working to construct language we were all comfortable with, we then mapped our learning outcomes to the ACRL Framework. For example, the committee identified the learning outcome “Identify & Locate Information Sources: Understand how information within a discipline is produced, organized, and disseminated, and use this knowledge to match information needs to appropriate information sources,” which mapped to three ACRL Frames: Information Creation as a Process, Searching as Strategic Exploration, and Research as Inquiry. This cross-referencing served a dual purpose of both aligning our outcomes to national standards, and also providing external confirmation that we were generally heading in the right direction. Indeed, one of our four core learning outcomes was entitled “Understand Scholarship as an Ongoing Conversation.”

Within this context, each semester I teach six or seven sections of a high-enrollment introductory theatre studies course. These particular sections of this 20-odd section course fulfill the aforementioned general education requirement, with a focus on writing within a discipline. In my experience, very few of the students enrolled in these sections are Theatre and Drama majors. They may have enrolled in the course for any number of reasons: because of a personal interest in theatre, because their course schedule aligned, or because an advisor or fellow student suggested it. Whatever the pull or push, most of these students are unfamiliar with how to conduct research on plays and playwrights. With few exceptions, they are novice researchers in the field, and will likely go on to study something completely outside of theatre studies. Because of this, and because of the course’s focus on writing within a discipline, it provides a unique opportunity to address Scholarship as Conversation from both a discipline-specific, and interdisciplinary perspective.

With both the library instruction core learning outcome and the ACRL Framework in mind, I attempted to address the abstract concept of scholarly communication as transparently and concretely as possible within the field of theatre studies. In effect, I wanted students to be able to visualize the ongoing conversation occurring amongst theatre scholars, and to be able to envision a space for themselves within it. In my lesson plan, I articulated this learning outcome as: “Students will develop awareness of the ongoing, evolving scholarly conversation within and across the discipline of theatre studies, and of themselves as a contributor.” In support of this
outcome, I designed active learning activities in order to encourage engagement (knowing there may be less intrinsic motivation for non-majors), and to assist students with transferring the concept of Scholarship as Conversation to other disciplines and contexts. However, similar to the constraints mentioned in the Literature Review, I too had only two sessions at a mere 50 minutes each, in which to address this as well as several other learning outcomes. Given this context, I developed two 15-20 minute activities which built on one another. In the first session, students completed a ‘Mapping Scholarly Conversations’ activity, and in the second session, they completed a ‘Reading Scholarly Articles’ activity.

Within the Mapping Scholarly Conversations activity, students utilize the pedagogical tools of role playing to enact their role as ‘scholars’—an especially fitting activity for theatre. In groups of four, they are each given a different colored handout with a unique fake scholarly article citation on the front, and a works cited list on the back (see Figure 1). These fake scholarly articles all cite one another in their reference lists, as students will soon discover. When I initially explain the activity, I ask students to put on their acting hats, and to imagine that they are in fact the scholar listed on the front of their handout, and that they have published this article, which cites the sources listed in the Works Cited on the back of the handout. To further ground the activity in course content, I make reference to many of the plays students are researching in the titles of the made-up articles and books listed as references.

Students are then provided with a graphic organizer to ‘map’ the scholarly conversations taking place among the fabricated citations (see Figure 2). The graphic organizer instructs them to first write their own name (the scholar they are role-playing) in the central box, and then to write the names of two scholars they have cited in their reference list in the boxes below. In the third step, they are asked to talk to the other members of their group in order to discover two other scholars who have cited them. Lastly, students are asked to identify a scholar who cited the same source that they did. While conjuring up fake citations and ensuring all of the relationships actually played out involved a bit of frontloaded work, this was infinitely easier than finding real citations that would fit this neatly into a one-page handout, and which integrated multiple plays taught in this course.
Figure 1. Fake article handout for Mapping Scholarly Conversations activity.

**Scholarly Conversation Map**

1. Your author:

2. Who did your author cite?

3. Who cited your author?

4. Who else cited this author?

Figure 2. Graphic organizer for Mapping Scholarly Conversations activity.
At the conclusion of this activity, I lead the students in a whole-class discussion of scholarly conversations. After asking some probing questions, I point out something that many of the students have already noticed while searching for sources earlier in the lesson: there simply isn’t much research published about their playwrights. I am beyond thrilled that the instructors for this course have been increasingly and intentionally teaching playwrights who identify as Black, Latinx, Caribbean, and Asian, members of the LGBTQ community, and immigrants. This also means that I am in the position of explaining why it is that the library has so few (if any) resources in our physical collections to support the students’ research, and why there are so few articles about their playwrights in our databases. Providing an opportunity for open discussion of this issue can also support the Authority is Constructed and Contextual frame, as well as explorations of bias. These are important issues to make visible, and in some ways, these painful revelations support a greater sense of urgency for students about why their voices are so important in this conversation. We are able to talk about why their voices are necessary. As Van Hoye notes, we should “acknowledge that students do participate in the scholarly conversation through their coursework and in their own interactions, despite the fact that it is often not recognized as scholarly because of the form and forum in which it takes place.”[18] By engaging with diverse voices in the field of theatre, and exploring the space their own voices might fill, students may more easily establish a purpose for research beyond the requirements of the course.

In the subsequent library instruction session, students are given one of two different five-page fake scholarly articles, which—with the exception of the title, author, keywords, and abstract—is written in lorem ipsum Latin (see Figure 3). In my many years of using this activity, I have only encountered one student who could read Latin, which is entirely the point. Students are asked to evaluate and develop a reading strategy for the article based entirely on visual cues, rather than on the content of the article. To support this, each ‘part’ of the article—the abstract, the author, the literature review, the methods section, the reference list—is identified with a number. In pairs, I ask students to discuss the following three questions, pausing to allow students to share their responses after each one:

- Which three parts should you look at:
  - When deciding whether the article is useful for your paper?
  - When deciding whether the article is scholarly / reliable / quality?
  - When trying to understand the article?
Because they have had an opportunity to discuss first with a peer, when I ask follow-up questions, nudging students to tell me why they would look at the abstract or the author’s affiliations, they are generally more confident in discussing their strategies and the reasons behind them. They have had the opportunity to think metacognitively about their reading strategies, and to compare these with those of their peers. This step is especially beneficial for the many students who are English language learners in this course, as the opportunity to practice with a peer before sharing in a whole-class setting can help build confidence.

After students have shared their responses to all of the questions in the full group, I then share my own approach to reading scholarly articles, noting the particular discipline in which I was trained (Education), and how my strategies shift if I am reading an article outside of my discipline (e.g., Biology). Finally, I invite the course instructors to share their own strategies—all of which tend to be quite different. I conclude by encouraging the students to pay attention to what works for them, and the varied contexts in which they read, and to explore different strategies depending on the context and their own objectives for reading. I ask them to be open to and notice as their strategies change over time and as they explore different disciplines.

Future Directions
Recently, I have taken on a new position as an instructional design librarian, focused on developing resources to support online courses, and so I am thinking about what these types of learning experiences could look like in an online environment. For example, an online learning object could potentially better illustrate the abstract concept of scholarly communication through visualizations and animations, as well as provide more responsive differentiation for learners who are at various stages of development in this area. I am excited by the affordances provided by platforms which can support numerous, asynchronous learners, and which can provide more support for differently abled learners through multiple means of representation, expression, and engagement. In addition, online library instruction can perhaps begin to chip away at the time limitations presented by one-shot instruction.

At the same time, I have not yet identified an equivalent learning experience for the rich conversations that I have observed during these activities. Much of the learning happens in the exchanges—the conversations between students that mirror the scholarly conversations they are studying. When they share with and question one another as peers, and observe these behaviors modeled by myself and their instructors, it creates space for and normalizes this type of self-reflective thinking. While online discussion boards have been used to great effect for semester-long courses, I haven’t yet identified an activity which satisfies this need for dialogic exploration within the confines of a librarian role for an online course. Perhaps this could be resolved through greater collaboration with faculty who are similarly employing active learning techniques (see Maybee, Doan, & Fleirl),[19] or through more responsive, interactive online learning objects. It is an area that is ripe for exploration.

**Conclusion**

Through these scaffolded activities, students build on the foundational understandings of scholarly exchanges, and identify the physical structures of scholarly articles, helping them to see and identify key evidence of these conversations and the structures that inform them as they play out in real life. In the course of these activities, students are also introduced to external factors which may not be visible at the outset—such as an author’s gender, race, nationality, sexual orientation, or other identities—that may impact a researcher’s ability to enter scholarly conversations as they encounter systems-level bias and discrimination. As April Hathcock asserts, these barriers to scholarly communication have critical impacts on democracy, access, and diversity, especially when viewed through the lens of intersectionality.[20] In addition, helping to make these structures transparent aligns with the Framework’s Knowledge Practice that learners “identify barriers to entering scholarly conversation via various venues.”[21] By supporting students in thinking metacognitively about their own approach to engaging with scholarly articles, and about how these structures and strategies may change depending on discipline and information need, as well as encouraging
students to think about their own role in engaging with the conversation, these obscure structures and processes are made more visible. It is by making the structures that shape the interactions of scholars transparent that library instructors can support students in entering the conversations and envisioning themselves as participants in future conversations.

Author’s note: I owe a debt of gratitude to Maureen Hill, an exceptionally talented and dedicated educator who introduced me to the foundations of reading strategies and the concept of metacognition during my teaching practicum at Iowa City High School.

Notes


[14] Rachel Elizabeth Scott, “Accommodating Faculty Requests and Staying True to Your Pedagogical Ideals in the One-Shot Information Literacy Session,” *Communications in Information Literacy* 10, no. 2 (2016): 132–42. 139.


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**Biography**

Julie (Jules) Arensdorf is an Instructional Design Librarian at the University of Wisconsin - Madison Libraries. She holds an MA in Teaching from the University of Iowa, and an MSLS from the University of North Carolina at Chapel Hill. Informed by her experience as the first person in her family to attend college, her professional interests center around issues related to equity and access in higher education.
CHAPTER 8
Delivering Faculty a Healthy Serving of the Framework

by Cate Schneiderman, Christina E. Dent, Emily Belanger, and Lindsey Nichols

Amuse Bouche

There is something about a surfeit of delicious things that tends to bring out the glutton in all of us. Think about it. Imagine a time you went to a buffet, a smorgasbord, even an unlimited salad bar. Whatever your preference, such an overabundance of choice can be overwhelming. You want to try a little of this dish and a little of that one. You want to see if this treat tastes good. And maybe on some level, you’d like to add a spoonful of something healthy just for nutrition’s sake. Before you know it, your plate is piled high with a wide assortment of main dishes, sides and even desserts. Maybe you’re already planning what to get during your second trip up before you’ve eaten your first bite.

For us, an overfilled buffet plate is a lot like building an instruction workshop for faculty. They want to include as many tasty bits of information literacy and research skills as possible—and who can blame them!—but we know it’s overindulgence and ultimately, not nutritionally sound for our students. As librarians, we know students need time to chew on new concepts, and we also know that our faculty want their students to fill up on information literacy goodness. How then, can we serve both of these customers a well-balanced meal?

Like many of you, we have adopted certain protocols for how and when we will do a library workshop for a particular course. We require two weeks’ notice for faculty to request an instruction session. We will only teach a workshop that is tied to a specific assignment. We have a two-week embargo at the start of both the Fall and Spring semesters where we will not do any instruction. All of these elements have been instituted over time in an effort to make our teaching load more sustainable, and to avoid faculty requests for what are essentially library orientations. In the past, with faculty, we would usually have a face-to-face conversation or a chat over the phone, where we had to “talk faculty down from the rafters,” so to speak, in order to create a learning experience with clear and assessable goals that were achievable within a limited amount of time. But it is so inefficient to have this conversation over and over again with individual professors. What if there was a way to convey the information in a faster, more appealing way that could be conveyed in a one-to-many format?
First Course

At the close of the 2017-2018 academic year, we were poised to move ahead with integrating instruction workshops into a course called CC100: Fundamentals of Speech Communication (CC is the course code for the Communication Studies department). Fundamentals of Speech Communication is a standardized course that all Emerson students are required to take, usually within their first year. The curriculum is comprised of four primary speech assignments: the Career Path presentation, the Rhetorical Analysis, the Pitch speech, and the IDEA speech. Each assignment has its own learning outcomes that align with the student learning outcomes of the course itself. The IDEA speech, for example, has the following assignment-based learning outcomes:

After completing this assignment, [students] will be able to:

- Create and deliver a seven minute persuasive presentation followed by two to three minutes of questions and answers that seeks to explain, alter perceptions or formulate belief around a specific topic of controversy or crisis
- Create and apply an outline using one of the persuasive structures
- Support your claims with appropriate evidence/supporting material with oral source citations
- Use precise, clear, and descriptive language that is adapted to your audience
- Use language that is ethical and respectful of your audience
- Deliver an extemporaneous persuasive speech using appropriate nonverbal delivery behaviors
- Deliver an extemporaneous persuasive speech using appropriate verbal delivery behaviors

Working with the required first-year oral communication course gave us an opportunity to both expand our departmental reach and to learn from a new group of faculty. For example, how do faculty in non-writing disciplines think about information literacy? How do they teach students to do research? This partnership also allowed us to make bold moves with instructional design; because the faculty had no preconceived notions about library instruction, they were immediately receptive when we introduced lesson plans based on more conceptual ideas.

We did not want, however, to create an instruction workshop in a vacuum based on what we thought students needed to know. We knew we had an opportunity to collaborate at the ground
level with the support of the CC100 program. To do this, we designed a one-day retreat for CC100 faculty, with the aim of sharing the pedagogy of the Framework for Information Literacy for Higher Education, data-gathering for a better understanding of the information literacy needs of first-year students in the course, and designing meaningful library instruction that directly aligned with the course objectives. Full disclosure: at Emerson, we are fortunate that our library director has discretionary funds available for faculty professional development. We were able to compensate our workshop participants for their time. Seven faculty members participated in the retreat, including the program director, two out of the three full-time CC100 faculty, and several long-time affiliated faculty members who each taught multiple sections of the course.

We held our retreat for our Speech Communication faculty in June 2018. To break the ice, we designed a series of guided activities for librarians and faculty to begin to make meaning of information literacy together. Our first activity was a visualization exercise often used by marketers in focus groups called a “projective technique.” These tend to be short, creative activities designed to elicit unspoken feelings about products or brands. Specifically, we used a series of 30-40 index card-sized photo images modeled on the branded Visual Explorer Cards.
We selected images that illustrated a variety of information and library-themed situations with some additional photos with strong connections to Emerson’s majors thrown in. The cards were spread out on a table and we gave faculty 20 seconds to examine the images and then to choose one image that best embodied their understanding of information literacy.

Faculty, of course, chose a wide variety of images to help them define the concept. We expected faculty to share very different definitions of information literacy and we used this to segue into richer discussions about the complexity of research and information seeking. For instance, one faculty member with a theatre background chose an image of a stage. For him, information literacy was the ability for students to present information in such a way that it became meaningful for a larger audience. This led to a rich conversation about how research functions in a speech class in ways that might be different from how research functions in a writing class. Another faculty member chose an image of a person shopping in a grocery aisle. She said she felt her students were like the shopper, faced with a myriad of information choices and that information literacy was the students’ ability to make the right choices. The goal of this exercise was to establish a working definition of a complex concept that is too often misunderstood or misrepresented. Information literacy itself, as a term, is not even something librarians agree on, let alone an idea with which faculty are comfortable and familiar.

Our next visualization activity involved the Framework itself. We had shared an executive summary of the Framework with faculty prior to the workshop and also provided digital copies of the six frames. At the retreat, we provided faculty with copies of each frame printed on individually colored paper. (Scholarship as a Conversation = blue; Information Has Value = green, etc.)
Faculty could immediately see the frames as separate but complementary concepts. In addition, faculty could easily break out different aspects of information literacy they wanted to focus on. Next, we likened designing a library workshop to filling a plate at a buffet or salad bar; there are lots of tasty choices, but you only have so much room on your plate. You also want to get enough of certain dishes so that your plate is nutritionally sound. This, in many ways, is a lot like designing a one-shot library session. There are a wide variety of “tasty” research strategies to impart within a very limited amount of time (see Appendix 1). In addition, librarians want to spend adequate time teaching and having students practice these skills so that meaningful learning occurs.

To keep faculty focused and aware of these constraints, we literally had them “fill a plate” with information literacy concepts pulled directly from the knowledge practices and dispositions of the six frames. We asked faculty to select one of the four primary speech assignments in the course; this assignment would be the “plate” they would fill. We then provided faculty with a
blank paper plate and color-coded “servings” for each frame. Faculty cut out a “main dish” that covered 50% of the plate and a “side dish” that covered 30% in the frames of their choice.

They then referred to the corresponding frame descriptions and selected one or two knowledge practices from the matching Frame and wrote it onto the corresponding section of their plate. The remaining 20% of the plate allowed faculty to include a content-based learning outcome of their own devising that was relative to the specific assignment. For example, one faculty member wanted to devote the remaining 20% of the class to teaching group dynamics in speech communication. The assignment in question had a learning outcome that was specifically tied to understanding group presentation techniques. The “fill-the-plate” format we used not only taught faculty about the Framework, but also established us as partners: we were no longer trying to steal their class time for extra content, we wanted to help them convey their subject content in the context of information literacy, and we wanted the inverse from them.
Second Course

Following the June retreat, we needed to analyze the data we had gathered from faculty and use that information to create content for information literacy workshops tailored to the CC100 curriculum. For the remainder of the summer, we held weekly instruction team meetings in order to plan and create these workshops, using the artifacts from the faculty workshop--like the filled-in plates--to plot our path forward. Traditionally, our process for designing a library workshop involved a librarian sitting down with a faculty member (either face-to-face or virtually) and together discussing the details of a research assignment, identifying learning goals for the library workshop, and focusing on student troubleshoots. With our retreat artifacts, we were doing a version of that, but using the collected data of seven faculty members and the combined expertise of five instruction librarians. As a team, we needed to synthesize the great ideas, thoughtful observations, and professional experiences of the group into a clear, coherent, and achievable plan for CC100.

Color-coding the frames helped the Speech Communication faculty and it worked for the library instruction team as well. After the faculty workshop, each librarian reviewed the faculty plates and brainstormed measurable student learning outcomes (SLOs) that related to the knowledge practices and dispositions faculty had “plated.” As the faculty had done on their plates, we drew the language of our SLOs directly from the Framework, writing each SLO on a slip of paper that matched the color we had assigned to the relevant ACRL frame.

All the librarians brought their frame-colored SLOs to a meeting and introduced them to the team. Moving the SLO slips around on a large table, we grouped related SLOs and studied them for patterns.
Figure 4: Student learning outcomes in frame-related colors.

Then, we reflected: had we come up with similar SLOs for multiple assignments? Were certain frames predominant across assignments? Was there a prevailing theme emerging from these groups of SLOs? Our reflective process was not unlike a typical one-on-one consult in which librarian and faculty member use their expert judgment to match student needs with classroom possibilities. Our faculty workshop functioned like a twelve-person “consult,” and afterwards the librarians used color as a tool to help us recognize and keep track of patterns on a larger scale as we applied our professional judgment as usual.

In our review of the faculty-driven SLOs, we identified three prevailing themes: faculty wanted students to approach research with curiosity, humility, and an eye towards transferring their skills into other contexts. We adopted these themes as our program goals:
Students who participate in a CC100 workshop will exhibit curiosity as they perform research; maintain openness about their own and others’ experiences; and look for applications in their other classes and daily lives.

This program goal statement served as a succinct way to describe our collaboration to the CC100 faculty, the campus, and ourselves. The large program goals were not directly measurable, but they provided direction as the library team returned to our SLO brainstorm and selected measurable SLOs that aligned with the coherent vision for the overall program. For each CC100 assignment, we reviewed the groups of colored SLO-brainstorm slips and identified the predominant frame that arose for each assignment. Then, out of our pile of colored slips, we selected one assessable SLO that aligned strongly with the program goal statement noted above.

For faculty who chose to fill a plate for the IDEA speech, for instance, we could see instantly which Framework concepts popped up the most. In Figure 4, you can see that the Scholarship is a Conversation frame (blue) and the Information Has Value frame (green) dominate. Since these SLOs were based on focus points the CC100 faculty had chosen, this type of visualization showed us what kinds of information literacy concepts faculty valued most for this particular assignment. We did this exercise with each of the four assignments, identifying the information literacy components faculty deemed most important for each exercise. Each assignment ended up with a unique information literacy-specific student learning outcome.

Our next step was to brainstorm different types of evidence we could collect in a library workshop that would demonstrate the student learning indicated. Once we had some ideas for the types of evidence we would accept, we broke into pairs to brainstorm activities that could produce such evidence. These became the workshops we took to the classroom.

**Third Course**

We ultimately created four workshop templates for CC100, which we introduced to the faculty--along with our program goals--at their annual orientation event. At the orientation, we summarized our findings from the summer retreat and shared this information with all of the CC100 faculty. This included the seven faculty members who participated in the retreat and the additional affiliated faculty who were preparing to teach during the Fall semester. We shared the four key SLOs we had created based on input from the retreat, but we did not indicate which SLO connected to which assignment. We invited faculty to choose which SLO most appealed to them based on their experiences of students’ needs. This has advantages over the typical method of faculty picking a workshop date first and determining the content later. The
Framework itself is not hierarchical. By removing any perceived ordering system between the frames, and instead keeping the focus on students' needs, we could eliminate the tendency for faculty to view research as a linear rather than an iterative process. After faculty selected an SLO, we revealed the assignment we had aligned it with and worked to schedule library workshops at an appropriate time for the given assignment. This started us on a strong footing because it meant the instructor was highly engaged with the content we would be working on together and that the classes were more or less evenly spaced throughout the semester rather than clustered within the first few weeks.

During the Spring semester, we repeated this exercise over email: asking each instructor which learning goal they wanted to engage with and then setting up a one-on-one meeting to schedule the session and confirm details. Most Spring classes were taught by repeat instructors but the consultations were still very useful to go over any possible improvements and to confirm that the faculty were still on board with the SLO and how it tied into the larger information literacy framework.

We viewed both the Fall and Spring semesters as largely a pilot opportunity. We committed ourselves to trying out various activities we had designed over the summer to demonstrate student learning. For example, we designed a peer critique activity around the IDEA speech assignment. Students were asked to start their research before the library session and bring the first few pages or abstracts of 3-5 resources they found with a short, one-sentence, annotation explaining why they picked it. Then, in the library workshop, students worked in pairs with a worksheet to critique each other’s research findings. The worksheet (see Appendix 2) suggested ways to help peers improve their research by bursting through potential “research roadblocks.” Examples included: too few results, sources are too broad, an important perspective is missing, no mention of the counter argument. To assess this activity, the librarian asked each student to state what their partner suggested for them. Pilot activities like these provided opportunities for us to innovate around specific assignments, and collaborate with faculty.

We also recognized that some pilot ideas might fail or require redesign along the way. We were forthright with both CC100 faculty and CC100 students about this and invited their feedback. For example, we tested an activity that asked students to revise the scope of potential research topics. In the library session, we grouped students together and had them examine various sources about Big Topics, and then had them work together to narrow down broad concepts into a focused research topic. Students struggled with developing research topics outside of their own interests. We decided to scrap this new design and reverted to more traditional flowchart worksheets. In order to further assess the impact of our new workshop templates, we drafted a Google form soliciting specific feedback that we sent to each CC100 instructor post-instruction during the Fall semester. We had 13 responses to the form from the 17 faculty who taught at least one section of CC100. 92.8% of respondents “Agreed” or “Strongly Agreed” with the following statements:

- The objectives of the library workshop were clearly stated.
The library instruction content was relevant to my teaching needs.

The material covered in the workshop was appropriate for the assignment.

The library workshop positively impacted my students' performance on this assignment.

In addition, faculty had generally positive views of their experience working with a librarian:

- “Overall, [the library workshop] was very helpful. Emily was an excellent collaborator and presenter.”

- “I felt [the library workshop] was very worthwhile and helpful to the students. I would like it to continue.”

- This workshop was really helpful! I think my students did better on their speeches because of it.”

Faculty also noted specific areas in which they saw evidence of student learning based on the library workshops:

- “We will have to update the examples from year to year, but I loved doing [the library workshop] during the [Rhetorical] Analysis [assignment] - early in the year and it had an instant impact on their assignments! THANK YOU for doing this with us!”

- “The examples used and the lessons around ‘constructed authority’ […] I think, directly led to students choosing better, more challenging topics for their analysis and their research into them was much deeper than previous semesters.”

- “Both of my classes had some problems in terms of identifying why and how a source was credible for their topics prior to the Idea Speech. I made it a concerted effort to ask them to approach the Logos of their speeches in a more meaningful way and I think the workshop helped solidify that effort….almost to the detriment of the pathos of these final speeches. There is obviously a balance to be found here (dependent on individual class needs) but it was a step in the right direction. Moreover, in in-class discussion after the final today both of my sections made the observation that the ‘struggle’--the process to find relevant and useful information--led them to find out more about their subjects that they were already interested in….and that their interest in the topic made that learning useful and interesting. That is EXACTLY what I hoped they would find.”

While none of these comments reference either the Framework or the individual frames specifically, this anecdotal evidence reflects the CC100 faculty’s understanding of concepts we worked on together. They also illustrate achievements toward the Framework-based learning outcomes derived from the summer retreat. For instance, several faculty refer to the Rhetorical Analysis assignment; the learning outcome for that assignment is directly aligned with the Authority frame, and faculty articulate the knowledge dispositions and skill sets relating to the Authority frame even if they do not label it as such. Faculty respond to the language of the
Framework because it closely mirrors pedagogical language with which they are familiar. Additionally, aligning assignment goals with the Framework allowed us to establish the faculty members primary information-literacy based learning goal up front, before a consultation even took place. We were able to circumvent the usual conversation about teaching students how to research or giving them an orientation to all of the library resources—and gently explaining that such tasks were not feasible in a one-shot session—and instead direct the faculty to a finite, measurable learning goal. This is not to say that the Framework necessarily makes our jobs easier, but it absolutely has reduced the labor intensity of delivering face-to-face workshops with an entire first-year program.

**Dessert Course**

Although this partnership with CC100 is only a year old as of this writing, we have established a strong relationship with all the teaching faculty and have an easily replicable on-boarding system for any new hires complete with checkpoints where we can assess comprehension. Furthermore, this partnership provides an unprecedented consistency in the information literacy given to first-year students across all of Emerson College. We can now state with certainty that all students are starting with this foundation. This is (hopefully) the first step towards curriculum mapping, a process that has been a long time coming at Emerson.

Going forward, we plan to employ these techniques to teach the Framework to other groups of faculty who wish to build with us. Having switched our focus to face-to-face workshops with CC100, we also need to redefine our working relationship with our first-year writing program. Like many colleges and universities, our first-year writing courses are largely taught by graduate students and affiliated faculty, many of whom are teaching for the first time. We are developing programming—modeled after our retreat with CC100 faculty—to introduce the Framework to these instructors. Our goal is to create six separate workshops digging into each of the frames that we can run on rotation on a semi-annual schedule. We aim to design these workshops so they could appeal to any faculty member, regardless of program or discipline.

**APPENDIX 1**

Name: ____________________________________________

Assignment: _______________________________________

CC100 Faculty Library Workshop, June 2018

Fusion Frames

Prioritize Your Plate
This plate represents your future library workshop: 75 to 95 minutes in duration. Librarians are amazing, but they can't cover every concept of Information Literacy in 95 minutes. Use this worksheet to choose your top two highest priority Information Literacy concepts you would like students to retain in your future library workshop.

Instructions:

Library Workshop
75 or 95 minutes
Side
(Secondary Frame)
30%
20-25 min
1-2 Dispositions
Course
Content
20%
Main Dish
(Primary Frame)
50%
35-45 min
1-3 Dispositions

1. Pick the assignment into which you would like to include a Library workshop.

2. Choose your top two Frames to address in that assignment. Refer to your notes from the previous activity and your multicolored ACRL Framework handout for ideas!
3. Cut out the provided "main dish" and "side dish" Frame choices and attach them to your plate.

4. Refer to the Dispositions sections of the multicolored Framework handout and write in 1-3 dispositions on the “main dish” portion and 1-2 dispositions on the “side dish” portion.

5. When you’re done, stick your plate up underneath the assignment you chose.

APPENDIX 2

Source Review Worksheet

Help your classmate advance their IDEA research

Directions: Evaluate your peer’s resources as a whole. Use their included 1-sentence notes to help you understand their research context. Then brainstorm ways to bust through research roadblocks! Circle and add your comments to all applicable suggestions below. When you’re done, give this to your peer as a research-help gift!

1. Few Results? There might be more out there. Brainstorm topic synonyms:

   ○ Ex: Searching “movies” doesn’t give you enough results. Try: film, cinema, motion pictures.

2. Sources too specific/detailed for a 7 minute speech?

   ○ Broaden scope of topic from ______________________________ to ______________________________

   ○ Ex: If “hurricane fatalities” gives too few results, try broadening your keywords: climate, weather, disaster, deaths

3. Sources too broad for a 7 minute speech?
○ Narrow scope of topic from _________________________ to
______________________________

○ Ex: Focus on a subtopic, or choose who, when, where, or how

4. Missing Perspectives:
_____________________________________________________________________

○ Are any of these sources authored by those directly affected by the topic? What voices are
not represented in the current 3-5

sources?

5. Add info from topic-specific sources:
_____________________________________________________________________

○ Websites of professional organizations/ NGOs/ government programs, etc.

○ Explore discipline-specific resources at https://guides.library.emerson.edu

6. Acknowledge counterargument (or, “Don’t ignore what you don’t like”):
_____________________________________________________________________

○ What are some conflicting perspectives or information on these sources?

Bibliography


Biographies

M. Catherine (Cate) Schneiderman, Emerson College: Cate is the Outreach Coordinator for Emerson College’s Iwasaki Library. She studied Library Science at Indiana
University-Bloomington and Marketing Analytics at Emerson College. In addition to being an active member of the Teaching & Learning team, she organizes events and answers questions about the library’s space and current happenings.

Christina E. Dent, Emerson College: Christina E. Dent is the Assistant Director for Teaching and Learning at the Iwasaki Library. She holds an MA in Literature from the University of Connecticut and an MFA in Creative Writing from Emerson College. Before beginning her career at Emerson in 2006, she taught extensively as an adjunct professor of literature and composition at institutions all over New England.

Emily Belanger, Emerson College: Emily Belanger (she or they pronouns) is the Instruction Librarian at Emerson College in Boston, Massachusetts. There, she works with the library’s teaching and learning team to design learning experiences for both students and faculty. She is passionate about authentic assessment, program planning, and deep collaboration with colleagues across campus.

Lindsey N. Nichols, Emerson College: Lindsey is the Online Learning Librarian at Emerson’s Iwasaki Library. She earned an MFA in Creative Writing from Sarah Lawrence College, and studied Library Science at Simmons College. Lindsey supports distance students and/or off-campus research at Iwasaki Library; she has an inordinate affection for screenshot guides, stable URLs, and emails with bullet points.
CHAPTER 9
Visualizing the Convergence of Metaliteracy and the Information Literacy Framework

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Introduction

Displaying information in a visual manner frequently enhances clarity. Highlighting thematic elements and their interrelationships can lead to understanding, even insights, that might not otherwise happen. While words describe, well-conceived graphics illuminate in both subtle and overt ways. Synergies between word and image are especially powerful.

The visualization at the heart of this chapter makes connections between two separate but related frameworks: information literacy and metaliteracy. The ACRL *Framework for Information Literacy for Higher Education* acknowledges that it was influenced by metaliteracy, and in particular, metacognition.[1] Metaliteracy emerged prior to the development of the ACRL Framework and was similarly designed to recast information literacy for a new era. While both provide comprehensive models, this chapter will explore the relationships between particular aspects of each: metaliterate learner characteristics and Framework dispositions. Metacognition will have a leading role in this analysis.
The ACRL Framework for Information Literacy for Higher Education[2] is informed by a number of theories and models from the fields of library and information science and education. The task force members who crafted the Framework drew upon two in particular, threshold concepts[3] and metaliteracy.[4] Threshold concepts affected both its structure and content, while metaliteracy primarily impacted the content. The document’s Introduction notes these influences but does not provide much detail. It refers to metaliteracy’s four learning domains: affective, behavioral, cognitive, and particularly, metacognitive.[5] However, metaliteracy is not represented as a holistic model in and of itself. This is not unexpected, but what is presented provides an incomplete understanding of metaliteracy and its impact. This chapter will delve more deeply into those connections, using a visual representation to clarify how the components might be used in praxis. How might the broader vision of metaliteracy inform librarians’ and disciplinary faculty members’ understanding and use of the Framework?

**Literature Review**

**Metaliteracy**

The metaliteracy framework was originally defined as a *reframing* of information literacy in a digital world that was transformed by Web 2.0, social media, and online communities.[6] Metaliteracy addressed the proliferation of different literacy types, from media literacy to visual literacy, by envisioning a comprehensive and unifying approach to learning through the lens of information literacy. It extended and conceptualized information literacy as a pedagogical model beyond skills development for searching and retrieving information to producing and sharing information in a connected social media environment. This approach was informed by several influences in theory and practice including the SCONUL Seven Pillars Model developed by the Society of College, National and University Libraries in the United Kingdom. Although still a primarily skills-based model, SCONUL presented competencies in an interconnected way and argued for “The ability to synthesize and build upon existing information, contributing to the creation of new knowledge.”[7] The idea of moving information literacy beyond just skills development was supported by James W. Marcum who argued that we needed more of an emphasis on “learning rather than information, and sociotechnical fluency rather than literacy,” which required a much broader conception of the term.[8]

In the first article that introduced metaliteracy, “Reframing Information Literacy as a Metaliteracy,” Mackey and Jacobson argued that “Metaliteracy expands the scope of information literacy as more than a set of discrete skills, challenging us to rethink information literacy as
active knowledge production and distribution in collaborative online communities.”[9] As part of this initial conception of the model, information literacy was envisioned as a metaliteracy, and the emphasis was placed on reimagining information literacy to include the collaborative production of new knowledge that is shared across multiple social platforms and open learning environments. Ultimately, information literacy and metaliteracy continued to evolve as distinct frameworks, but the ideas have been interrelated from the start.

As metaliteracy developed further in the book *Metaliteracy: Reinventing Information Literacy to Empower Learners*, Mackey and Jacobson identified the meta in metaliteracy through the Greek origins of the prefix which invokes “change” as well as something that happens “after” or “beyond.”[10] This theoretical expansion of the definition added to the original conceptualization of the term and situated metaliteracy in relation to both literacy and information literacy. Mackey and Jacobson argued that “while literacy is focused on reading and writing, and information literacy has strongly emphasized search and retrieval, metaliteracy is about what happens beyond these abilities to promote the collaborative production and sharing of information.”[11] Further, the meta in metaliteracy expands the connection to metacognition as well. This is especially important to the development of the model since “metaliteracy also includes a metacognitive component and openness to format and mode that is less pronounced in information literacy.”[12]

Metaliteracy continued to advance as a learner-centered model with a unique set of goals and learning objectives that were informed by four domains of learning, including metacognitive, cognitive, behavioral, and affective.[13] This approach emphasized the development of the metaliterate learner who embodied these four domains and was prepared to play a range of empowering roles, such as producer, participant, communicator, translator, author, teacher, and researcher.[14] This was an important shift from applying information competencies to envisioning the metaliterate learner and what was needed to prepare individuals to be effective in these interrelated roles. The metacognitive domain of metaliterate learning was especially emphasized to develop and reinforce reflective thinking and empowered learning.

As metaliteracy developed as a pedagogical model, it was applied to the concerns of the post-truth world in the book *Metaliterate Learning for the Post-Truth World*.[15] The framing chapter for this volume introduces the fully developed metaliterate learner characteristics in which “these essential attributes reinforce the four domains of metaliteracy (behavioral, cognitive, affective, metacognitive) and underpin the metaliteracy goals and learning objectives.”[16] As part of this application of metaliteracy to the challenges of the post-truth world, the goals and learning
objectives were also revised to further emphasize the evaluation of both individual and content bias, the ethical considerations of intellectual property, the responsibilities of information production, and preparing oneself for pursuing lifelong learning goals. This revision was purposefully aligned with the four domains of metaliterate learning and the introduction of the characteristics of metaliterate learning.[17]

As the theory of metaliteracy expanded, the ideas were put into practice through several projects developed by the Metaliteracy Learning Collaborative, a team of educators at The University at Albany and SUNY Empire State College led by Mackey and Jacobson. This work included several Massive Open Online Courses (MOOCs) and a competency-based digital badging system, as well as learning objects and open resources available at the Metaliteracy.org blog. In addition, Trudi Jacobson led a team of faculty librarians at the University at Albany to develop *The Information Literacy User’s Guide: An Open, Online Textbook* that was informed by metaliteracy and has been downloaded over 30,000 times through this open format.[18]

**The ACRL Framework**

Metaliteracy and the Association of College and Research Libraries (ACRL) *Framework for Information Literacy for Higher Education* both emerged from an interest in redefining a new approach to information literacy that recognized a transformed information environment. This realization inspired novel approaches to information literacy that went far beyond the outdated Information Literacy Competency Standards for Higher Education.[19] In addition, each approach more accurately reflected pedagogical practice in the field and the educational potential of a reconceptualization. The structure and overall concept of the ACRL Framework suggested “a cluster of interconnected core concepts, with flexible options for implementation, rather than... a set of standards or learning outcomes, or any prescriptive enumeration of skills.”[20] This was a striking contrast to the extensive list of standards and competencies offered by the original Information Literacy Competency Standards for Higher Education.

Metaliteracy influenced the ACRL Framework but the overall organization of the document and thematic emphasis was informed by threshold concepts as described by Meyer, Land, and Baillie.[21] In their discussion of threshold concepts, Meyer, Land, and Baillie argue, “there are certain concepts, or certain learning experiences, which resemble passing through a portal, from which a new perspective opens up, allowing things formerly not perceived to come into view.”[22] This approach created a *transformational* opening to learning through some kind of gateway that is much more conceptual than fixed standards or competencies.[23] The ACRL
Framework does not include a visual model of this approach, which may limit the conceptual understanding and relatability of the concepts. Practitioners in the field have developed ways to represent the information to highlight key concepts but this work has not led to a fully realized visualization of the ACRL Framework.

### Metaliteracy and Metacognition

The ACRL Framework is similar to the metaliteracy framework because standardized competencies have been replaced by open-ended conceptual structures based on key information and research themes. Both models are similarly de-centered to create openings for educators and learners to apply the thematic ideas in a wide range of information environments and across multiple disciplines. The acknowledgment of an affective aspect of learning in the dispositions outlined in the ACRL Framework is similar to the way metaliteracy looks at the entire person through the lens of the four learning domains.[24] Both models move beyond skills-based behavioral activity by addressing a broader approach to learning that supports how people engage with information and each other within complex information environments.

The Information Literacy Standards had emphasized the behavioral and cognitive learning domains, and the need was recognized, both in the development of metaliteracy and the Framework, for a more inclusive vision, adding both the metacognitive and affective learning domains. Gibson and Jacobson expressed this need in a piece written in 2014, during the development of the Framework:

> The process [of moving to enhanced understanding of information literacy threshold concepts] is not solely a cognitive one, but also affective and metacognitive. Learners need to recognize that their own information behaviors can be improved. This may be an uncomfortable or unfamiliar process that they need to monitor regularly. They must also think about their own thinking, checking in to assess if they are being open to and inclined to use new methods, rather than reverting to more familiar behaviors.[25]

The revised definition of information literacy in the ACRL Framework also reflects aspects of metaliteracy:

> Information literacy is the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued,
Similar to metaliteracy, this revised definition of information literacy recognizes the integration of multiple competencies that include a reflective, or metacognitive dimension. This recasting of information literacy moves beyond the search and retrieval emphasis of the earlier definition and, as with metaliteracy, recognizes the critical importance of the active creation of information as a content and knowledge producer. It also advances the idea of being a responsible contributor to participatory communities and social environments.

At the same time, while these key concepts are embedded in the revised definition, the ACRL Framework does not fully expand upon metacognitive reflection in the same way that metaliteracy has. As part of his original discussion of metacognition, Flavell argued that individuals encounter situations that “provide many opportunities for thoughts and feelings about your own thinking to arise and, in many cases, call for the kind of quality control that metacognitive experiences can help supply.”[27] This critical point addresses two key aspects of metacognition that are especially relevant to both information literacy and metaliteracy. First, metacognition is a reflective activity sparked by a variety of everyday situations, and second, it has a self-regulating dimension that empowers individuals to take control of their learning. As Flavell envisioned, metacognition “could someday be parlayed into a method of teaching children (and adults) to make wise and thoughtful life decisions as well as to comprehend and learn better in formal educational settings.”[28] Flavell’s work is especially relevant today as we design pedagogical theories and practices to encourage learners to be reflective and purposeful in information environments while taking charge of their learning in these spaces.

Metaliteracy influenced the content of the ACRL Framework, but the metacognitive dimension that is critical for metaliterate learning was not as prominent as it could have been by the time the document was ultimately written and presented. According to Fulkerson, Ariew, & Jacobson, there was interest in expanding the metacognitive component during the drafting of the Framework but this key aspect was not fully addressed in the published version.[29] As a result, the authors “contend that the diminution of metacognition and metaliteracy in subsequent drafts resulted in a diminishment of the Framework’s usefulness as a teaching tool.”[30] They make a strong case for why metacognition should be integrated into information literacy, because “without reflection learners will neither change to see themselves as empowered learners with authoritative voices, nor will they be conscious of their own attitudes.”[31] By diminishing the influence of both metacognition and metaliteracy, the ACRL Framework does not entirely
advance the benefits of reflective learning. In addition, the value of collaboration in participatory environments is another key competency that is also absent from the document. Fulkerson, Ariew, and Jacobson assert that now is the time to revisit the inclusion of both metaliteracy and metacognition in the ACRL Framework and to restore these themes as originally envisioned in the early drafts of the document.[32] In many ways, metaliteracy provides an anchor or focal point for the Framework that extends beyond influence to include a means for envisioning and enacting the frames.

While the influence of metaliteracy was diminished in the final draft of the ACRL Framework, researchers and practitioners in the field pursue the relationship between information literacy and metaliteracy in theory and practice. For instance, in “Accommodating Faculty Requests and Staying True to Your Pedagogical Ideals in the One-Shot Information Literacy Session,” Rachel Elizabeth Scott integrates the ACRL Framework with metaliteracy and metacognition. The author applied question-posing as a metacognitive strategy to transform a required one-shot library session into a participatory learning environment for learners that expanded their understanding of the platforms and information examined. [33] In “Teaching and Learning with Metaliterate LIS Professionals,” Nicole A. Cooke and Rachel Magee argue that being information literate or media literate today is not enough because learners and educators need to expand their critical thinking beyond any particular literacy. The authors combine both metaliteracy and the ACRL Framework into their teaching practices to achieve their pedagogical goals.[34]

In her chapter “First, Teach Students to Be Wrong,” Allison Hosier describes how she integrates both metaliteracy and the ACRL Framework in her teaching. She analyzes the learning goals of her freshman seminar course *Empowering Yourself as a User and Creator of Information* with the Metaliteracy Learning Goals and Objectives, selected Knowledge Practices from the ACRL Framework, and related course topics.[35] In “Exploring Metaliterate Learning through the Frames of Information Literacy,” Thomas P. Mackey explores metaliteracy and the ACRL Framework as complementary models that reinforce innovative learning design. The author describes the relationship between the Characteristics of Metaliterate Learning and the ACRL Framework’s six frames of learning through the analysis of a final project developed for a Massive Open Online Course (MOOC), *Empowering Yourself in a Post-Truth World.* [36]

As demonstrated in these examples, the interrelationship between the ACRL Framework and metaliteracy plays out in a wide range of pedagogical practice, from one-shots to MOOCs.
Visualizing the areas of convergence between both frameworks will illustrate the potential for using these concepts in tandem.

Connecting Metaliterate Learner Characteristics and Information Literacy Framework Dispositions

Metaliteracy is encapsulated in its core components—characteristics, learner roles and learning domains—all connected through practice. The chapter authors thus had to determine which of these constructs would serve as the best foundation to make explicit connections between metaliteracy and the Framework. The metaliterate learner characteristics provide a core structure that allows for an explicit connection. As part of this analysis, a new graphic is presented in this chapter that illustrates the relationship between the existing metaliterate learner characteristics and the dispositions embedded in the ACRL Framework.

The Framework, too, has a variety of components to select from: the core descriptions of each frame, the understandings of experts and novices found within those descriptions, and the frame-based knowledge practices and dispositions. The descriptions of each frame and the illustrative selections of knowledge practices and dispositions are challenging to visualize. However, just as the learner characteristics encapsulate who a metaliterate individual is, so too do the suggested dispositions of an information literate person. While dispositions may appear to be less encompassing than characteristics, they are at the heart of how an individual interacts with their surroundings and specifically the information environment. The absence of a visual representation of this core idea in the official ACRL Framework may prevent the full articulation of this key idea. Providing scaffolding for the dispositions makes it possible to move beyond simple laundry lists of traits. Metaliteracy provides that scaffolding. In the Metaliteracy Characteristics and Information Literacy Dispositions figure (Figure 1), each of the eight metaliterate learner characteristics (represented by the inner circles) is linked to congruent Framework dispositions (summarized in the outer boxes). Additional dispositions that might be identified—those in the Framework are not meant to be exhaustive—may also be considered in light of this model.
This visualization of the characteristics of the metaliterate learner in relation to the dispositions of the ACRL Framework for Information Literacy for Higher Education illustrates the convergence of both models. This integrated and expanded figure demonstrates the areas for potential overlap as well as current gaps in congruence. The circular and flexible nature of the metaliteracy model, which has been applied to all of the metaliteracy diagrams to date, provides an open context for this mapping of ideas. The following sections examine the alignment of each
of the metaliteracy characteristics with particular Framework dispositions,[37] ordered by the characteristics as they appear in Figure 1, beginning with the top position. While Figure 1 includes the corresponding dispositions in shortened form, the following text and the interactive version of the figure (linked in the caption) provide the full wording of the dispositions.

Informed

Being an informed consumer of information is a vital aspect of metaliteracy that reinforces ongoing critical thinking related to how we research and analyze information. This characteristic in particular “traces back to the core information literacy principles that effectively differentiated between technology skills and broader information proficiencies.”[38] This requires learners to ask critical questions about the origin of information, how accurate and reliable it is, and the extent to which it contains bias. The informed characteristic supports all of the other metaliteracy attributes within a comprehensive framework and reinforces the value of producing information from the perspective of an informed consumer. Doing so encourages individuals to process, produce, and publish information that is accurate and verifiable.

The following Framework dispositions align with the informed characteristic:

- Are inclined to seek out the characteristics of information products that indicate the underlying creation process (Information Creation)
- Develop awareness of the importance of assessing content with a skeptical stance and with a self-awareness of their own biases and worldview (Authority)
- Seek guidance from experts, such as librarians, researchers, and professionals. (Searching)

In addition to the dispositions listed above, there is another disposition that also relates to this characteristic:

- Realize that information sources vary greatly in content and format and have varying relevance and value, depending on the needs and nature of the search (Searching)

The critical evaluation of information is the process that allows individuals to become informed. The information we assess today takes a wide variety of formats, arrives via different modes of
transmission, and, of course, ranges in nature from evidence-based to opinion pieces. Absolute accuracy is not always possible to discern or even attain, but there are markers for accuracy based on expertise, evidence, and relevance. The informed characteristic and a number of the Framework dispositions emphasize the importance of valuing high-quality information and recognizing that this takes time and understanding, both of factors surrounding the information, such as its creation process, and of one’s own needs.

The informed metaliteracy characteristic supports all the other metaliteracy attributes because it is core to critical thinking in today’s information environment. Being informed impacts the creation of information, the quality of collaboration, and the level of engaged participation, including one’s role as a citizen. Informed individuals possess the inclination to be adaptable to new technologies and information settings, and to understand and value openness, all processes and competencies that require reflection. The Framework dispositions encompassed by metaliteracy’s informed characteristic draw on three of the frames, including Authority is Constructed and Contextual, Information Creation as a Process, and Searching as Strategic Exploration.

The informed characteristic clearly encompasses the idea of evaluation, but as part of a thoughtful, nuanced process that is reflective as well. The dispositions express the idea that there is ambiguity in identifying the best quality information. For example, Authority is Constructed and Contextual’s “Motivate themselves to find authoritative sources, recognizing that authority may be conferred or manifested in unexpected ways” recognizes that this is not a straightforward process.

To be informed takes sustained work and therefore time. The critical stance identified in a Research as Inquiry disposition must be internalized as a value so that individuals are willing to put in the necessary effort to achieve a particular research goal. In short, if one is not committed to the habits of mind that are necessary to be informed, one cannot claim to be either metaliterate or information literate. This requires a reflective process about one’s thinking and learning that is especially advanced through metaliteracy.

Collaborative

Being collaborative is essential in today’s social information environment and reinforces productive dialogue among all participants. From a metaliteracy perspective “the metaliterate learner is actively engaged in professional, personal, and collegial partnerships that include like-
minded viewpoints but also support diverse perspectives that expand and challenge individual preconceptions or beliefs."[39] This requires individuals to extend beyond their own familiar communities to engage with people who have unique perspectives and viewpoints. Metaliterate learners work together to create knowledge communities that are cooperative, participatory, and informed.

The following Framework dispositions align with the collaborative characteristic:

- Recognize they are often entering into an ongoing scholarly conversation and not a finished conversation (Scholarship)
- Seek out conversations taking place in their research area (Scholarship)

Collaboration is a key feature of metaliteracy, as illustrated by the originating visual featured in the first metaliteracy MOOC, in which it intersects across defining metaliteracy elements (http://metaliteracy.cdlprojects.com/what.htm). A refined version of this figure also appeared in the first metaliteracy book and by that time collaboration was visualized as a key outcome of metaliteracy.[40] This emphasis on collaboration distinguished metaliteracy from the information literacy standards of the time which largely cast information-related skills as individual undertakings. The increasingly participatory and dynamic environments in which information circulates, develops and evolves requires that individuals not only know how to retrieve and synthesize information for their own purposes, but also how to responsibly exchange, share and co-create information in these spaces.

The Framework acknowledges this shift in information creation processes with a revised definition of information literacy that includes “participating ethically in communities of learning.”[41] Not surprisingly, the collaborative characteristic is most evident in the Scholarship as Conversation frame. This frame emphasizes that knowledge creation is an ongoing and cooperative process undertaken by communities of scholars, researchers and learners who contribute their varied perspectives and interpretations. These interactions can take place in various venues, both formal and informal. By recognizing the connections and overlaps between scholarly conversations and interactions that take place in social media and online communities, students may be able to better grasp the inherently collaborative nature of information production, and likewise, recognize their own roles and responsibilities as contributing participants in these spaces.

Participatory
The **participatory** characteristic recognizes the interactive and social dimension of information environments and is closely related to being collaborative in these spaces. Participation involves interaction with individuals in cooperative community settings and social media environments. As part of this ongoing process, “individuals are free to express themselves online but must also consider the public responsibilities that accompany the production and sharing of creative works.”[42] Metaliterate learners create new knowledge by working closely with individuals and groups in a wide range of social settings that are often mediated by technology. They build collaborative and participatory communities that take responsibility for the information that is published through media.

The following Framework dispositions align with the participatory characteristic:

- See themselves as contributors to the information marketplace rather than only consumers of it (Information has Value)
- See themselves as contributors to scholarship rather than only consumers of it (Scholarship)
- Understand the responsibility that comes with entering the conversation through participatory channels (Scholarship)

This shift in the role of the learner from passive information consumer to active participant and contributor in information environments is a key concept for both metaliteracy and the Framework. The rapid production and distribution of information (and misinformation) through social media environments require that learners not only understand the nature of information production and sharing but also recognize their responsibilities as participants in these dynamic environments.

Metaliteracy encourages learners to take on active roles in their own learning and in the production of new knowledge. The **participatory** characteristic encompasses critical and collaborative engagement with information in a variety of formats. The original reframing of information literacy as a metaliteracy asserted that “Information-literate individuals acquire the ability to understand information using different forms of technology...This constitutes a practice of critical engagement with one’s world as active and participatory learners.”[43] By actively engaging in the information creation process, learners are more likely to develop a stronger understanding and appreciation of the value of all different types of information.
The Information has Value and Scholarship as Conversation frames articulate both the empowerment and the responsibilities associated with participation in information environments. In online spaces in which information circulates freely, it’s critical that learners not only understand copyright laws, but actually develop a deeper appreciation for the original information and ideas of others. At the same time, open access resources, interactive technologies, and collaborative tools such as Creative Commons provide learners with opportunities to have a significant impact by sharing their contributions and building on the creations of others. Leveraging appropriate technologies and responsibly engaging in online communities empowers learners to share their unique perspectives and develop a richer worldview.

Reflective

The **reflective** characteristic reinforces the metacognitive dimension of metaliteracy and is embedded in the metaliteracy goals and learning objectives.[44] This characteristic advances Flavell’s assertion that metacognition is both reflective and self-regulating.[45] From a metaliteracy perspective, the reflective characteristic “fosters thinking about one’s own thinking and the self-regulation of one’s own literacy and learning.”[46] Metaliterate learners play an empowering role in reflecting on what they already know and where they need to expand their knowledge areas. Being reflective supports the ability to take charge of one’s own learning and also to become more aware of how individuals develop as metaliterate learners.

The following Framework dispositions align with the reflective characteristic:

- Develop awareness of the importance of assessing content with a skeptical stance and with a self-awareness of their own biases and worldview (Authority)
- Are conscious that maintaining these attitudes and actions requires frequent self-evaluation (Authority)
- Are inclined to examine their own information privilege (Information Has Value)

While the following dispositions are not included in the visualization, they do address elements of reflection found in two additional frames, Research as Inquiry and Searching as Scholarly Exploration:

- Seek appropriate help when needed (Research)
● Demonstrate intellectual humility (i.e., recognize their own intellectual or experiential limitations) (Research)

● Seek guidance from experts, such as librarians, researchers, and professionals (Searching)

● Persist in the face of search challenges, and know when they have enough information to complete the task (Searching)

The **reflective** characteristic aligns with the metacognitive learning domain that is a vital component of metaliteracy. Reflecting on and regulating one’s own learning is a necessary precondition to all of the metaliterate learner characteristics. Metacognition is noted specifically as having influenced the content of the Framework, as it is “crucial to becoming more self-directed in [the] rapidly changing ecosystem.” [47]

Dispositions connected to metacognition, or the **reflective** characteristic, are found in four of the six frames. The metaliteracy characteristic considers “the role of thinking about one’s own thinking and self-regulating one’s own learning” for overarching, life-long learning.[48] The dispositions found in the Framework are both all-encompassing and more focused on a particular frame. They range from knowing when to seek help (Research as Inquiry, Searching as Strategic Exploration), recognizing one’s own limitations and biases (Authority is Constructed and Contextual, Research as Inquiry), and the need for self-evaluation and persistence (Authority is Constructed and Contextual, Searching as Strategic Exploration).

**Civic-minded**

The civic-minded characteristic is essential for effective participation in social settings because it emphasizes the responsibilities of being a part of any community. Being civic-minded “requires civic responsibility and a focus on the public interest” that “must extend to social media environments and online communities that depend upon community-based accountability.”[49] This characteristic reinforces the idea that joining a community is not enough and also requires purposeful civic engagement as a responsible contributor and participant. Doing so relies on related characteristics such as being reflective about one’s engagement with social communities, open to new perspectives, collaborative with others and participatory in a shared space.

The following Framework dispositions align with the civic-minded characteristic:

● Respect the original ideas of others (Information Has Value)
- Recognize that systems privilege authorities and that not having a fluency in the language and process of a discipline disempowers their ability to participate and engage (Scholarship)

- Question traditional notions of granting authority and recognize the value of diverse ideas and worldviews (Authority is Constructed)

Being **civic-minded** prepares individuals to make valuable and purposeful contributions to communities as individuals and in collaboration with others. This quality reinforces the potential value and impact of both formal and informal participation because everyone is encouraged to play an active role in building community. This characteristic emphasizes the responsibility of being an information producer and participant since all members of the community depend upon the contributions made by everyone.

The **civic-minded** characteristic is similar to aspects of the Framework’s Information has Value, Scholarship as a Conversation, and Authority is Constructed and Contextual frames. The disposition “respect the original ideas of others” is situated within the Information has Value frame which supports several dimensions of information “as a means of negotiating and understanding the world”. This approach provides a way to understand information and related responsibilities, such as access, copyright, and attribution within a real world social context. Rather than looking at information as something to be searched and retrieved, it is also understood as a means for content creation and communication.

The civic-minded characteristic is reinforced through the disposition “recognize that systems privilege authorities and that not having a fluency in the language and process of a discipline disempowers their ability to participate and engage”. This disposition supports the Scholarship as a Conversation frame which advances research as a scholarly dialogue among participants. Doing so requires responsible and civic engagement within participatory environments that are both formal and informal. Aspects of the civic-minded characteristic can be found in the disposition “Question traditional notions of granting authority and recognize the value of diverse ideas and worldviews” which is part of the Authority is Constructed and Contextual frame. This frame supports the role that experts play in society and the importance of communities to provide context for how authority is understood. These are concepts that are supported through a civic-minded approach to information production and participation.
Adaptable

Being adaptable prepares individuals for flexible learning environments and emerging technologies that continuously change and evolve. The adaptable characteristic supports the ability “to be responsible and flexible to new ways of learning and knowing, including approaches mediated by technology.”[50] Metaliterate learners are empowered to effectively apply technologies for content creation and participation, while being aware of personal privacy and information security. They are also reflective about their technology adoption and use. They think carefully about the role technology plays in our society and the impact it may have on what they create and how they communicate.

The following Framework dispositions align with the adaptable characteristic:

- Accept the ambiguity surrounding the potential value of information creation expressed in emerging formats or modes (Information Creation)
- Exhibit mental flexibility and creativity (Searching)
- Persist in the face of search challenges, and know when they have enough information to complete the information task (Searching)

The constantly evolving information landscape requires that learners not only have an understanding of current information technologies, but are also able to adapt as new technologies and formats emerge. Metaliteracy promotes the adaptable characteristic as an essential component of lifelong learning. Metaliterate learners are open to change, willing to learn and try new things, and able to reassess and adjust by reflecting on personal learning strategies, strengths, and areas that need improvement.

The adaptable characteristic is encompassed in the Information Creation and Searching frames. Adaptability is a valuable asset during the search process, which typically requires an iterative approach when selecting keywords and attempting various search strategies. The exploration component of the Searching as Strategic Exploration frame promotes the idea that learners should embark on a search task with an open mind and embrace the non-linear path that research typically entails. Learners who exhibit the dispositions in this frame are open to new discoveries while using a variety of information sources and strategies to reassess original goals and needs as understanding develops.
Metaliterate learners exhibit adaptability as both consumers and creators of information. The included Information Creation disposition emphasizes the need for learners to make their own judgments on the value of a particular source of information while considering the potential impact of its format and mode of delivery, rather than automatically ranking certain formats above others. Metaliteracy takes this concept further by encouraging learners to consider the impact of format and mode when creating information, taking into account the adaptations that may be required to translate information for diverse audiences.

**Open**

The open characteristic supports transparent teaching and learning in a wide range of social communities. Consider the importance of “being open to new ideas, insights and perspectives” in divisive or contested social environments because this characteristic “allows individuals to think beyond their own biases that might limit their learning experiences.”[51] This approach prepares individuals to have empathy in social spaces and to gain a deeper understanding of individuals and groups that may have different perspectives from our own. Metaliterate learners openly create and share knowledge by working collaboratively with others as both teachers and learners. This characteristic expands upon the original metaliteracy reference to Open Educational Resources (OER) by considering openness itself as a quality that a metaliterate learner possesses, and not just a document type.

The following Framework dispositions align with the open characteristic:

- Develop and maintain an open mind when encountering varied and sometimes conflicting perspectives (Authority)
- Seek multiple perspectives during information gathering and assessment (Research)
- Recognize the value of browsing and other serendipitous methods of information gathering (Searching)

While the following dispositions are not included in the visualization, they do address two more elements of openness, one found in Research as Inquiry, and the other pulling in the Scholarship as Conversation frame:

- Maintain an open mind and a critical stance (Research)
- Suspend judgement on the value of a particular piece of scholarship until the larger context for the scholarly conversation is better understood (Scholarship)
The **open** characteristic encompasses participation in communities, as a learner, a teacher, and an information creator and sharer. It recognizes the importance of being open to new ideas, insights, and perspectives that are contributed by others in person or by online community members. In today’s highly polarized society, being open is critical to the discourse needed to find common ground and to move on to the possibility of new insights informed by multiple perspectives.

Relevant dispositions come from three of the frames: Authority, Research, and Scholarship. The first of these dispositions is considered through the lens of authority. It specifically mentions “developing and maintaining an open mind when encountering varied and sometimes conflicting perspectives.” Research as Inquiry’s “maintaining an open mind” mirrors the same disposition found in Authority is Constructed and Contextual, while Scholarship as Conversation includes a disposition relating specifically to assessing scholarship only once one is situated in the appropriate scholarly conversation.

Being open to diverse perspectives, ideas, people, and communities enriches and informs learners. This openness extends to considering oneself and others, who may not have official credentials, as teachers, while acknowledging the value of their information contributions. This quality reinforces civil discourse because all perspectives are considered and valued. Being open also means situating oneself in a conversation or information exchange, be it scholarly or not, to become familiar with the particulars before making judgments. Openness can be seen as a characteristic that provides scaffolding for six dispositions across three frames that have several different emphases.

**Productive**

The **productive** characteristic is key to metaliteracy because it supports the foundational idea that learners are producers of information. This aspect “reinforces being a creative producer of original and repurposed content, both individually and in collaboration with others.”[52] As a transformative quality, being productive means that learners are not just passive consumers of information but also active producers who understand the way that information is created and shared. Information in this context is a form of communication that tells a meaningful story in creative, informed, and reflective ways.

The following Framework dispositions align with the productive characteristic:
• understand that different methods of information dissemination with different purposes are available for their use.
• see themselves as contributors to scholarship rather than only consumers of it
• value the skills, time, and effort needed to produce knowledge

The **productive** characteristic of metaliteracy is reinforced by the Information Creation as a Process and the Information has Value frames. The disposition “understand that different methods of information dissemination with different purposes are available for their use” (Information Creation) demonstrates a significant shift in how information literacy is understood as a means for creating and producing and not just an entity for accessing and retrieving. This is a critical recasting of information because it defines this process as an iterative one that involves research as a core activity for the creation and revision of content that is then shared as an outcome of this work.

Metaliteracy’s **productive** characteristic also aligns with the dispositions “see themselves as contributors to scholarship rather than only consumers of it” and “value the skills, time, and effort needed to produce knowledge,” as part of the larger Information has Value frame. Both dispositions support active creators of content and contributors to information environments who understand the value of information as producers and not just consumers. This particular frame expands the scope of information itself as more than a commodity and instead as a way to better understand our world. Doing so involves an understanding of intellectual property and the contributions made by experts in our society.

Overall, the characteristics of the metaliterate learner align well with the six frames of information literacy and related knowledge practices and dispositions. This sampling of potential overlap in theory can be strengthened and realized through everyday practice.

**Appendix and Tables**

Appendix 1 and Tables 1 and 2 summarize the information captured in Figure 1 and the analyses of the eight characteristics above. Appendix 1, arranged by metaliterate characteristic, provides the complete wording of the aligned dispositions and identifies the originating frame.
The following tables, one arranged by metaliteracy characteristic and the other by frame, provide illuminating snapshots of the relationship between the two literacy models. Table 1 shows that three of the eight characteristics, informed, civic-minded, and productive, are aligned with three frames. The collaborative characteristic, however, only aligns with Scholarship as Conversation. Although the Framework’s Introduction states that it was influenced by metacognition in particular, this is not borne out by the links between disposition and characteristic, which indicates that only two frames include reflective dispositions: Authority is Constructed and Contextual and Information Has Value.[53]

Table 2, which uses frame as the organizing principle, clearly shows that dispositions connected to Research as Inquiry have little overlap with the metaliterate characteristics. While it is only aligned with one characteristic, open, the other five frames are connected to three characteristics each. We explore these connections and distinctions further in the Discussion section that follows.

<table>
<thead>
<tr>
<th>Metaliteracy Learner Characteristics</th>
<th>Framework Frames</th>
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<tbody>
<tr>
<td>Informed</td>
<td>Authority, Information Creation, Searching</td>
</tr>
<tr>
<td>Collaborative</td>
<td>Scholarship</td>
</tr>
<tr>
<td>Participatory</td>
<td>Information Has Value, Scholarship</td>
</tr>
<tr>
<td>Reflective</td>
<td>Authority, Information Has Value</td>
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<tr>
<td>Civic Minded</td>
<td>Information Has Value, Scholarship, Searching</td>
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<tr>
<td>Open</td>
<td>Research, Searching</td>
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<td>Adaptable</td>
<td>Information Creation, Searching</td>
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<tr>
<td>Productive</td>
<td>Information Creation, Scholarship, Information Has Value</td>
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Table 1: Overlap of information literacy disposition frames with metaliterate learner characteristics

<table>
<thead>
<tr>
<th>Framework Frames</th>
<th>Metaliteracy Learner Characteristics</th>
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<tbody>
<tr>
<td>Authority is Constructed and Contextual</td>
<td>Informed, Reflective, Civic Minded</td>
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<tr>
<td>Information Creation as a Process</td>
<td>Informed, Adaptable, Productive</td>
</tr>
<tr>
<td>Information Has Value</td>
<td>Participatory, Reflective, Civic Minded, Productive</td>
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<tr>
<td>Research as Inquiry</td>
<td>Open</td>
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<tr>
<th>Scholarship as Conversation</th>
<th>Collaborative, Participatory, Civic Minded, Productive</th>
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<tbody>
<tr>
<td>Searching as Strategic Exploration</td>
<td>Informed, Civic Minded, Open, Adaptable</td>
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Frame dispositions aligned with metaliterate learner characteristics

**Discussion**

In our analysis of which dispositions align with which characteristics of the metaliterate learner, we found that there is a clear connection between the metaliteracy and information literacy models. There are several examples of dispositions that are required to show evidence of having that characteristic. Metaliteracy provides a scaffolding that moves the dispositions from elements of conceptual understandings about information, research and scholarship into components of lifelong learning and lifelong engagement with information.

By using metaliteracy’s characteristics as an organizing principle, the resulting visual (Figure 1) ties together dispositions across frames, providing a new lens through which to understand and use the Framework. Similarly, this approach provides an opening or pathway to apply metaliteracy from a Framework perspective, to enhance those ideas and even fill in gaps that may not be fully realized in the document. Providing scaffolding for the dispositions makes it possible to move beyond simple laundry lists of traits. When teaching learners the core concepts of the six frames, metaliteracy is an organically-connected, broadly conceived overlay that highlights concrete personal lifelong learning elements.

The confluence of characteristics and dispositions strengthens the argument that activities and assessments based on checklists or standards are inadequate. For example, being informed means evaluating information based on factors relevant to a specific situation, and that situation may not conform to generalized criteria. Sources of information are myriad and evolving, and to be informed is to understand the potential complexity of the information environment while also assessing relevant but possibly conflicting sources. The dispositions highlight the ambiguity of identifying the most effective information for a particular purpose. For example, Authority is Constructed and Contextual’s “Motivate themselves to find authoritative sources” highlights the
non-linear path that assessing authority may take. Such models as The CRAAP (Currency, Relevance, Authority, Accuracy, and Purpose) Test do not adequately address the issues encompassed by this informed-related cluster of dispositions.[54]

When identifying dispositions that align with the characteristics, the authors found that the metaliteracy qualities were especially action-focused, whereas many of the dispositions, while not entirely passive, were less product-focused. For example, one of the dispositions connected to the productive characteristic is “See themselves as contributors to scholarship rather than only consumers of it,” rather than something such as “Contributes to scholarship.” However, there is a knowledge practice that begins, “contribute to scholarly conversation at an appropriate level.” This is true for a number of items captured in the figure and indicates that, ideally, both dispositions and knowledge practices would be positioned to capture each characteristic more fully. In other words, the dispositions alone do not entirely capture what are in the characteristics, but if joined by some of the knowledge practices, they would include more of the learner as producer aspect, rather than just trying to prepare individuals to produce. However, the complexity of such a visualization would be daunting, both to create and to process.

While there are clear connections and overlaps between the characteristics and dispositions, the visualization also identifies distinctions between the metaliteracy and information literacy models. Notably, the collaborative characteristic in the figure only includes two related dispositions that come from the Scholarship as Conversation frame. These dispositions assert that information literate learners seek out and enter into scholarly conversations, and that they recognize the value of their own contributions and the contributions of others. However, they stop short of describing the co-creation of knowledge that is envisioned by metaliteracy. Multiple Frames emphasize shared interactions and conversations (e.g. Information Creation’s “accept that the creation of information may begin initially through communicating in a range of formats or modes” and Research as Inquiry’s “seek multiple perspectives during information gathering and assessment”). Yet they do not fully articulate the joint endeavors and productions that are enabled by social media and online communities. Collaboration is defined as “the action of working with someone to produce something.”[55] While the dispositions describe shared dialogue and interaction in information communities, the Framework needs a much stronger emphasis on the collaborative production of information that takes place in these social environments. This emphasis is embedded in the metaliteracy model and would provide a worthwhile point of overlap between both approaches.

Conclusion
This chapter explores the relationships between two prominent frameworks that seek to prepare learners as participants and contributors to the current information landscape. By illustrating the connections between the metaliterate learner characteristics and the ACRL Framework dispositions, the authors hope to define areas of overlap and facilitate the development of these vital competencies in today’s learners.

While both the ACRL Framework and the metaliteracy framework are comprehensive models, the clarity of each benefits from this convergence of ideas in theory and practice. Academic librarians look to the Framework for guidance in their information literacy instruction, but may not have a complete roadmap for how to practically teach these complex concepts. Additionally, since the ACRL Framework is intended to impact all of higher education, and metaliteracy is an open model, disciplinary faculty and academic administrators should be a part of this conversation as well to make decisions about how best to prepare our learners for an ever-evolving information environment.

By better understanding the Framework’s connections to the metaliteracy model from which it was partially derived, all stakeholders, including librarians, faculty, administrators and learners, will gain a more practical grasp on its origins and underlying principles. The succinctness of the metaliteracy characteristics may help illuminate the core ideas behind the Framework dispositions that educators should aim to foster in their students. Likewise, for those seeking a deeper understanding of metaliteracy, the alignment between metaliterate learner characteristics and information literacy dispositions provides a useful visualization that highlights both the overlaps and distinctions between these two models.

As part of this conversation, we encourage our readers to consider the connections between metaliteracy and the Framework beyond the characteristics and dispositions analysis found in this chapter. Each model contains additional elements that may potentially be linked in ways that will enrich the understanding and application of both. This convergence between theory and practice, and between metaliteracy and the Framework, will unite our efforts to best serve our learners.
### Appendix 1: *Framework* Dispositions Organized by Metaliteracy Characteristics

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<thead>
<tr>
<th><strong>Framework Dispositions</strong></th>
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<tr>
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<tr>
<td>Develop awareness of the importance of assessing content with a skeptical stance and with a self-awareness of their own biases and worldview</td>
<td>Authority is Constructed and Contextual</td>
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<tr>
<td>Seek guidance from experts, such as librarians, researchers, and professionals</td>
<td>Searching as Strategic Exploration</td>
</tr>
<tr>
<td><strong>Collaborative</strong></td>
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<tr>
<td>Recognize they are often entering into an ongoing scholarly conversation and not a finished conversation</td>
<td>Scholarship as Conversation</td>
</tr>
<tr>
<td>Seek out conversations taking place in their research area</td>
<td>Scholarship as Conversation</td>
</tr>
<tr>
<td>Participatory</td>
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<td>-----------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>See themselves as contributors to the information marketplace rather than only consumers of it</td>
<td>Information has Value</td>
</tr>
<tr>
<td>See themselves as contributors to scholarship rather than only consumers of it</td>
<td>Scholarship as Conversation</td>
</tr>
<tr>
<td>Understand the responsibility that comes with entering the conversation through participatory channels</td>
<td>Scholarship as Conversation</td>
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<tr>
<th>Reflective</th>
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<tr>
<td>Are conscious that maintaining these attitudes and actions requires frequent self-evaluation</td>
</tr>
<tr>
<td>Develop awareness of the importance of assessing content with a skeptical stance and with a self-awareness of their own biases and worldview</td>
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<tr>
<td>Are inclined to examine their own information privilege</td>
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<tr>
<th>Civic Minded</th>
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<tr>
<td>Respect the original ideas of others</td>
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<tr>
<td>Recognize that systems privilege authorities and that not having a fluency in the language and process of a discipline disempowers their ability to participate and engage</td>
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<tr>
<td>Question traditional notions of granting authority and recognize the value of diverse ideas and worldviews.</td>
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<tr>
<td>Accept the ambiguity surrounding the potential value of information creation expressed in emerging formats or modes</td>
</tr>
<tr>
<td>Exhibit mental flexibility and creativity</td>
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<tr>
<td>Persist in the face of search challenges, and know when they have enough information to complete the information task</td>
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<tr>
<td>Maintain an open mind and a critical stance</td>
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<tr>
<td>Seek multiple perspectives during information gathering and assessment</td>
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<tr>
<td>Recognize the value of browsing and other serendipitous methods of information gathering</td>
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<tr>
<td><strong>Productive</strong></td>
</tr>
<tr>
<td>Understand that different methods of information dissemination with different purposes are available for their use</td>
</tr>
<tr>
<td>See themselves as contributors to scholarship rather than only consumers of it</td>
</tr>
<tr>
<td>Value the skills, time, and effort needed to produce knowledge</td>
</tr>
</tbody>
</table>

**NOTES**


[28] Flavell, 910.


[31] Fulkerson et al., 36.


[38] Mackey, 22.


[43] Mackey and Jacobson, “Reframing Information Literacy as a Metaliteracy,” 70.


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CHAPTER 10

Seeing Can Become Believing:
Teaching Multimodalities and Data Visualization
in a Credit Bearing Information Literacy Course

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UL100 and “Information Creation as a Process”

The progression of expected information literacy and technology skills for undergraduate students at Emporia State University (KS), or ESU, mirrors the evolution in the Association of College and Research Libraries (ACRL) from the Information Literacy Competency Standards for Higher Education to the Framework for Information Literacy for Higher Education. The ESU Libraries and Archives (ULA) has been involved for decades in teaching introductory and higher-level information literacy proficiencies in undergraduate and graduate courses. However, an opportunity presented itself in the spring of 2007 for ULA to create a specific information literacy course during a University-wide revision of the undergraduate General Education
A new core skill of “Information Literacy and Technology” was implemented during this revision, and ULA librarians as faculty members were invited to become part of teaching that General Education skill. The librarians wrote a proposal for a course that would eventually become UL100, “Research Skills, Information, and Technology” and the proposal was accepted by the ESU General Education Council to become part of the new General Education curriculum as of Fall 2009. A decade later, UL100 has expanded to an average of six sections offered per semester with a maximum enrollment of 25 students per section. UL100 sections are now taught each semester in a variety of formats: a traditional semester-long face-to-face environment; completely online throughout a semester; and a compressed online form taught during the last 8 weeks of a given semester.

In the Spring 2018 semester, the UL100 faculty began to change the emphasis of UL100 to reflect an increasingly multimodal world in which information is communicated immediately via social media, live video feeds, and the unfortunate reality of fake news to manipulate emotions and reasoning. This information revolution is illustrated in a commentary from Project Information Literacy’s 2018 report, *How Students Engage with News: Five Takeaways for Educators, Journalists, and Librarians*:

As soon as their days begin, news finds them. A CNN alert flashes across a smartphone screen, a tap to a Feedly icon pumps out a steady flow of top stories, and a Facebook check brings up a meme with a satirical twist on a Congressional debate. In an early morning class, an instructor uses a breaking news story from The New York Times to start a discussion on election meddling, and over lunch, two friends pore over news of a school shooting. For many college students in America today, the news is an overwhelming hodgepodge of headlines, posts,
alerts, tweets, visuals, and conversations that stream at them throughout the day. While some stories come from news sites students choose to follow, other content arrives uninvited, tracking the digital footprints that many searchers inevitably leave behind.¹

Two items in particular have greatly influenced the future of UL100 and its impact upon student learning for lifelong information literacy fluency. The first item was the discussion and subsequent adoption by the ACRL Board in 2016 of the ACRL Framework for Information Literacy for Higher Education. Previously, the student learning outcomes, assignments, and assessments in UL100 had been based upon the ACRL Information Literacy Competency Standards. While perfectly acceptable during the initial time frame and teaching of early UL100 sections, it had become clear that these Standards and UL100 outcomes were far more linear in approach than the concept of information literacy had become in reality. For example, the Standards do not necessarily address the creation of new knowledge in terms of dynamic learning objects which can be modified and updated in a matter of seconds. In a world in which our students are constantly receiving data, and in which the data changes continuously, key factors that students must take away from their university experiences are adaptability, flexibility, and a willingness to question almost any source in terms of accuracy.

The second item was an increase in the number of credit hours for UL100. When UL100 became a part of the ESU General Education curriculum, it was originally offered for two credit hours. However, there are other General Education courses that will also fulfill the “Information Literacy and Technology” core skills requirement, and these courses are three credit hours. As a result, some students were reluctant to take UL100 because they needed a three-credit-hour course to maintain a full-time course load or to graduate on time. A proposal from ULA to
increase UL100 to three credit hours was approved in late Spring 2018, and by Fall 2018 all sections of UL100 were set at three credit hours each.

The twin effects of the Framework and the additional credit hour were catalysts for the UL100 faculty to rewrite student learning outcomes for UL100 and to establish a revised curriculum that would construct explicit crosswalks among those outcomes, assignments, and assessments with the ACRL Framework. The new outcomes created in Summer 2018 were matched accordingly with each frame. The faculty also decided to enhance an existing UL100 outcome of “Technology” as a connecting overarching theme to include a broad concept of multimodalities and data visualization into the course. This decision was quite deliberate to correspond even more closely with the General Education core skill requirement that emphasizes “technology” as a part of information literacy. More to the point, though, was the need to avoid teaching specific technologies as learning outcomes in and of themselves. Technologies are constantly evolving, and as librarians/educators, we want our students to realize that a conceptual view of technologies is essential for lifelong personal and professional success.

While all five frames were used in the revamping of the UL100 curriculum and learning outcomes, the "Information Creation as a Process" frame has allowed for unique exploration in the creation of data visualizations in our revision of the UL100 curriculum and learning outcomes. This frame’s definition states that “Information in any format is produced to convey a message and is shared via a selected delivery method. The iterative processes of researching, creating, revising, and disseminating information vary, and the resulting product reflects these differences.” More specifically, as seen in Table 1, we sought to connect two new UL100 learning outcomes to part of this frame’s knowledge practices and dispositions.3
<table>
<thead>
<tr>
<th>Learning outcome</th>
<th>Knowledge practices</th>
<th>Disposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess how information products created through various processes meet their intended uses and conveyed messages</td>
<td>Assess the fit between an information product’s creation process and a particular information need</td>
<td>Value the process of matching an information need with an appropriate product</td>
</tr>
<tr>
<td></td>
<td>Recognize that information may be perceived differently based on the format in which it is packaged</td>
<td>Accept that the creation of information may begin initially through communicating in a range of formats or modes</td>
</tr>
<tr>
<td>Demonstrate the use of a variety of technologies and multimodal media tools effectively through hands-on experience</td>
<td>Recognize the implications of information formats that contain static or dynamic information</td>
<td>Resist the tendency to equate format with the underlying creation process</td>
</tr>
<tr>
<td></td>
<td>Develop, in their own creation processes, an understanding that their choices impact the purposes for which the information product will be used and the message it conveys</td>
<td>Understand that different methods of information dissemination with different purposes are available for their use</td>
</tr>
</tbody>
</table>

**Introducing Data Visualization in UL100**

In the first two weeks of a given semester, UL100 students select topics relating to their major fields of study or personal interests. Students are encouraged to select research topics that are fairly broad in scope to allow the exploration and evaluation of various perspectives, particularly in terms of potentially controversial topics. To help students become more connected
to social and civic initiatives on campus, some of the UL100 faculty will establish themes for their sections and ask their students to work on topics related to those themes. For example, two UL100 faculty members collaborated in Spring 2019 with a university-wide Emporia at the Table (EAT) Initiative\textsuperscript{4} to bring campus awareness to food insecurity and food injustice to college students. In that semester, these UL100 students selected topics that aligned with the food literacy theme. Topics included:

- How food aids in child development,
- Food insecurity and student athletes diets,
- How food insecurity affects the social life of college students,
- How climate change and agriculture affect food scarcity.

The research topics in all UL100 sections are then explored in greater depth throughout the semester through a series of scaffolded assignments that culminate in the production of web portfolios and presentations of their work. In the two-credit-hour version of UL100, students had the opportunity to experiment with data visualization through the creation of an infographic that highlighted certain facts about the topic. The extra credit hour has provided the luxury of time to ask students to consider in greater depth the concept of data visualization as filtered through the “Information Creation as a Process” frame, knowledge practices, and dispositions.

While the UL100 curriculum covers each of the ACRL frames, it also has an overarching focus on technology that allows UL100 faculty to incorporate unique student assignments by using a variety of tools that integrate data visualization and multimodal presentations of information.
Kress and Van Leeuwen define multimodality as the combination of two or more communication modes that create one end product. In combination, the modes work together to relay the intended message. Examples include the overlay of narration to screen capture, or the addition of images and graphs to a textual poster that expand upon the meaning. While UL100 faculty can and do create their own distinct assignments, a few core assignments remain common among sections. Examples include an infographic and a web portfolio, which is used as a culminating assignment at the end of the term. These two multimodal assignments are integrated, incorporating information from multiple lessons or topics such as practicing citation styles, utilizing multiple perspectives, and appropriately presenting information to their audiences. Throughout the assignments, students are encouraged to think both creatively and critically about their topics and their presentations. To meet the scholarly requirements of the infographic assignment, students find and cite an image that contributes to their research. This is often a painting, photograph, or sculpture that forces them to think about their topic in a new light and find connections they may not have considered before. One student researching mental health disorders found a painting by a famous schizophrenic artist. The artwork provided her with both a primary source, and valuable and unique insight into the disorder.

The infographic assignments and assessments are presented in various ways in the UL100 sections, depending upon the instructors’ lesson plans, assignment learning outcomes, and the format of the section (face to face, or online). While all sections of UL100 utilize the same learning outcomes, they are employed in different assignments depending on each faculty member’s preferences. One instructor might choose to focus on using a variety of technologies as an outcome, while another might focus on a student’s ability to assess the end product as a means of communicating with a specific audience. For instance, a section of UL100 in Spring
2019 that was taught entirely online during the last eight weeks of the semester required students to create a beginning infographic that highlighted information to introduce themselves to their fellow students. The infographic was deliberately low-stakes in terms of the grading. In this section, an assessment scheme known as specifications grading was used and the beginning infographic was categorized as an optional engagement activity. However, the students who chose to try out the infographic perceived the activity as useful preparation for other data visualization assignments in the class.

The major infographic assignment that is consistent throughout all UL100 sections regardless of format is a carryover from the two-credit-hour course version. As noted earlier, though, the additional credit hour has given the instructors more time to concentrate upon concepts of data visualization as they relate to infographic design. The major infographic assignment, much like the web portfolio, provides a chance for the students to explore freely available multimodal tools. By using a free infographic software such as Piktochart, Venngage, or Canva, students explore data representation and the presentation of information through the creation of charts, graphs and other visual representations allowing them to explore their creative side while using logic and reasoning. Student feedback about the major infographic assignment was quite positive in a semester-long UL100 online section taught in Spring 2018. Nine students out of 17 (53%) in this section reported in an informal survey given by the instructor that the infographic assignment was their favorite one in the course and appreciated the opportunity to express their creativity.

One example of transferring multimodality skills for application in other courses is discussed later in this chapter with a multimodality assignment in EG102, Composition II, taught through the ESU English, Modern Languages, and Journalism Department (EMLJ). A second EMLJ course, EG596/796: Studies in Literary Genres: Comics, also assigns infographics as a
presentation assessment. EG596/796 explores visual literacy using comic and graphic novel literature with the purpose of "addressing differences and convergences between visual and nonvisual media."6 Students perform close readings of comic and graphic novel literature and have an opportunity to "approach comics and graphic novels pedagogically, creatively, and critically as a medium for literary study."7 One method includes creating an infographic to present visually their research over a specific comic or graphic novel, a certain genre, or a comic writer, artist, colorist, or illustrator. In the Fall 2019 semester, this class consisted of six undergraduate students and three graduate students. Four students in the class had already taken UL100 prior to EG596/796 and expressed confidence in exploring academic resources and utilizing tools to create infographics and websites as a direct result of their prior UL100 assignments.

Despite their enthusiasm toward the infographic, it is important to note that this type of assignment can be a challenge for both students and instructors alike because it is not a semester-long assignment like the web portfolio. Many students in the course have not yet used design software such as Piktochart and will have difficulty trying to navigate the software. In addition, students in UL100 sections who have not had the opportunity to create the type of beginning infographic mentioned previously may be slightly intimidated by the more in-depth infographic assignment with more detailed expectations of communicating a topic clearly in a visual format. Generally, UL100 students who struggle with creating infographics report that the creation of charts, graphs, and other figures within an infographic program can present the greatest difficulty. In these instances, UL100 faculty can emphasize to the students that clear, appealing visual content is essential for conveying a message within an infographic.
Finally, the faculty utilize various assessments of data visualization for students to summarize and design concrete examples of the knowledge practices and dispositions inherent in “Information Creation as a Process”. Through class discussion and the examination of real-life examples, students first come to understand the role and importance of various forms of multimodalities today. When studying infographics or posters, for example, the class discusses the purpose of each multimodality and attempts to identify the intended audiences based on vocabulary, imagery and design. Applying what they have learned, students are then asked to find their own examples and to share those examples on the class online discussion board for analysis. As a final assessment, students create their own end-products using two or more modes, planning both the content and layout as appropriate for their own intended audience. In Spring 2019, students in one face-to-face section of UL100 worked in groups to create posters that evaluated library databases. The poster was created in addition to a group in-class presentation and served as a summary and visual representation of their evaluation. By adding images and design elements to a textual base, the students created learning objects that were meant for a peer audience rather than their instructor. As an opportunity to share their knowledge with peers, students were challenged to reflect on what they learned and to provide a product for a group that they identify with on a social and educational level. Velez et al. noted in their study that through peer instruction, students experienced an increase in metacognition, as well as engagement and participation in the classroom. In the future, however, having each student design their own poster may be more beneficial, as the thought process can stay true to each student as they explore their own creative and logic processes. While collaborative work exploring databases and presenting findings positively impacts student attitudes toward learning and their overall achievement through interaction and cooperation, procedural and cognitive
autonomy is eliminated when group work is continued into the design portion of the assignment. Students lose their ability to make decisions regarding class procedures and organization, and on their independent choices regarding the subject matter and its presentation. This loss of both cognitive autonomy and ownership in their learning can hinder motivation by disempowering students.9

**Challenges and Opportunities with Teaching Online and Data Visualization**

When introducing multimodalities to students, it is important to identify the technology skills of the current class and environment. This initial assessment can be accomplished in a syllabus quiz at the beginning of the course or as a question at the beginning of a one-shot session. Identifying the skill set will provide clarification on whether or not an introduction to a specific tool is necessary. In order to avoid issues where students may overestimate their technology skills and knowledge, UL100 faculty incorporate a section of recommended/optional resources for students to access throughout the semester. These resources may include hyperlinks to video tutorials as introductions to a program, contact information for ESU Information Technology personnel to assist with technical problems, and links to readings that provide a basic overview, introduction, or comparison of freely available infographic software to help in selecting a program to use.

The introductory infographic assignment is an excellent method for preliminary assessment of technology skills and familiarity with data visualization. It is helpful to present this assignment to students by asking them to create an infographic using a topic -- themselves -- that requires very little research on their behalf. Providing students the opportunity to experiment casually with infographic creation tools (e.g. Canva, Piktochart, Venngage, etc.) without the pressure of presenting their formal research topics offers students the time and resources to learn how to use
infographic creation tools. Students will familiarize themselves with these resources and using the feedback from the instructor on their introductory infographic, they will have more expertise for constructing and presenting a more formal research topic using this medium. UL100 faculty who have used the introductory infographic assignment have also found that infographic submissions for the formal research topic are more appealing, more organized, and align better with the assignment’s learning outcomes. The students are also more prepared to focus upon reviewing their research and identifying key elements, statistics, facts, or quotes they would like to share in the infographic assignment for their specific topics.

For students with existing advanced skills in creating infographics, another type of data visualization assignment could incorporate augmented reality. Virtual reality (VR) and augmented reality (AR) are growing trends in education because they allow users to interact actively with the data. Ilya Dudkin explains that “VR and AR visualization is all about telling a story that you cannot tell with numbers alone” and lists several AR/VR examples, including users’ interactions with maps, the solar system, and nature. AR/VR has been introduced as an additional form of data visualization in several UL100 sections as a currently trending form of multimodality.

AR/VR can be an intimidating topic to teach in introductory information literacy sessions. The Information Creation as a Process frame states that “information in any format is produced to convey a message and is shared via a selected delivery method.” With AR/VR becoming increasingly familiar to students, it is essential to demonstrate how AR/VR and other emerging technologies can be utilized to convey a message. This type of resource provides students the opportunity to contribute to the scholarship by presenting their research in more current and engaging ways. Once students have the opportunity to see how easily one can contribute to
information available on the Internet, they are more aware of how credible and reliable these resources may or may not be.

One example of AR/VR as a form of multimodality to teach data visualization is by assigning students to enhance their infographics with augmented reality. Using their infographic as the image, students in a UL100 section were introduced to a resource called BlippAR, which allows students to embed virtual resources related to their topics layered over their infographics. Students embedded resources such as permalinks to journal articles, web resources, social media, etc. and embedded YouTube videos or audio files of presentations that introduced their topics. By embedding these resources virtually, students could then engage with one another’s research and resources by interacting with the .png, .jpeg, or .pdf files of the infographics.

The concept of AR/VR assignments in UL100 was inspired in part by a review of results from an ESU Student Technology Survey conducted in November 2016 by the Learning Technologies division of ESU’s Information Technology department. 736 undergraduate and graduate students responded to this survey, which gathers information about student “perceptions and orientation toward technology, the number and types of devices owned and the extent to which they use their digital devices as well as the importance of that use.” 74% of students responding to the survey owned a smartphone device and used it for academic purposes, while 69% believed that smartphones were important to their academic success. In this sense, BlippAR as an app for another form of data visualization integrates well with students’ enthusiasm about their smartphones and other devices. BlippAR requires students to interact both with their laptops and with their mobile devices. At the same time, students are being introduced to a trending technology in an educational/intellectual context.
It should be noted, though, that incorporating augmented reality as a multimodality has its limitations in comparison to other types of resources. For example, using BlippAR can present challenges for faculty teaching online-only courses in particular because of the time it takes for a “blipp” (image) to publish the AR/VR features. In an online teaching environment, this potential time delay will defer in turn the feedback and comments from the faculty member to the student. The delay in publishing the AR/VR features may also cause some inadvertent difficulties if the “blipp” is incorrectly published or if other technical issues interfere. In contrast, faculty teaching face to face courses or individual instruction sessions can easily resolve these issues by having the students log directly into BlippAR and show their “blipps” during the class session.

Screencasting is another form of modality introduced to UL100 students. Also known as screen sharing or screen capturing, screencasting has grown in popularity over the years, especially with the rise of eSports programs in higher education and media platforms like Twitch.\textsuperscript{15} According to Hannah Gerber, “video game streaming requires streamers (video game players who broadcast their play in real time to online crowds) [to] simultaneously negotiate multiple modes of communication (reading, writing, listening, speaking, and presenting.)”\textsuperscript{16} Video gamers utilize screencasting to share their streams and engage with their audience. Similar to video game streams, screencasting assignments are appropriate to incorporate into higher education to help in developing skills beyond those of reading and writing.

Screencasting is an additional way for students to feature their research while also connecting with other modalities such as Prezi or PowerPoint presentations, or a web portfolio. With screencasting, students have the ability to experiment with creating audio and video files, uploading videos to platforms like YouTube, sharing videos through cloud-based platforms. As a
result, students are able to perceive themselves as contributors to scholarship and not just passive consumers of information.

The semester-long online section of UL100 typically includes two opportunities for students to experiment with screencasting, using tools such as Screencastify, Screencast-o-matic, or Zoom. The introduction to this modality begins by assigning students to record and upload a video tutorial about a specific library database that relates to their research topic. The upload, which can be a YouTube video or a direct URL to the video, is submitted via Canvas, ESU’s learning management system. The second opportunity is a final project for students in this specific UL100 online section and requires students to utilize screencasting to present their web portfolios and explain the navigation and content as visual artifacts.

The primary disadvantage of teaching screencasting in terms of an information creation process is not necessarily the technology itself. It is the reality that there will always be a few students who are hesitant about being on “camera” or recording audio. Therefore, it is essential early in a given semester for the instructor to increase confidence in the students by 1) demonstrating the assignment and tools through a screencast, 2) providing tips for success in public speaking, 3) providing examples of the assignment for students, and 4) showing how to upload their video to YouTube (or other media platforms). In the video upload tutorial portion, the instructor also has a chance to teach the students about privacy settings to ensure that only the instructor and, if desired, the students in the course can view the video.
Specifications Grading, the Framework, and UL100

By its very nature, the Frame of “Information Creation as a Process” implies that learning is never a finite product never to be revised or revisited. The Introduction to the Framework notes that “Students have a greater role and responsibility in creating new knowledge, in understanding the contours and the changing dynamics of the world of information, and in using information, data, and scholarship ethically. Teaching faculty have a greater responsibility in designing curricula and assignments that foster enhanced engagement with the core ideas about information and scholarship within their disciplines.”

In the 2018-19 academic year, several UL100 faculty implemented a series of formative assessments of student learning collectively known as “specifications grading”. As explained by Linda Nilson, one of the recent proponents of this system, specifications grading removes stressful haggling over a few points in a graded assignment. More important, as Nilson observes:

[Specifications grading] gives faculty strategies for developing and grading assignments that reduce time and stress, shift responsibility to students to earn grades rather than “receive” them, reduce antagonism between the evaluator and the evaluated, and increase student receptivity to meaningful feedback, thus facilitating the learning process….It may even restore some credibility to grades by demonstrating how they can reflect the learning outcomes students achieve.

In the UL100 sections currently utilizing specifications grading, the completion of an assignment is primarily based on a rubric detailing the assignment's criteria to be considered as “complete” or “incomplete”. A “complete” assignment fulfills all aspects of the criteria outlined in the
rubric. An “incomplete” assignment, in contrast, fails to fulfill one or more criteria. The syllabus for a given UL100 section clearly states the minimum number of “complete” assignments a student must submit by the end of the course or by a set deadline to earn a grade of A, B, C, D, or F. In turn, the student has the choice to revise and resubmit an “incomplete” assignment as many times as needed within a given timeframe.

UL100 faculty have found that a change to specifications grading has had, overall, a positive effect in the way that students complete assignments, particularly for those involving data visualization:

1) By offering students more opportunities to “redo” an assignment they misunderstood or did not complete correctly without the penalty of a lower grade;

2) By providing more flexibility and creativity on the students' behalf to experiment with multimodality tools such as embedding augmented reality to their infographic or embedding their camera into a screencast as they present their web portfolio;

3) By providing more opportunities for students to earn the grade they desire by completing additional assignments similar to extra credit or completing alternative assignments, encouraging these students to experiment with other multimodalities and broaden their learning experiences. With the “alternative assignments” approach, students in one of the UL100 online sections may choose to complete another learning activity in exchange for other assignments. The most popular multimodality alternate assignment is a group assignment in which several students working together may utilize Skype, Zoom, or similar web conference software to record a group screencast. The screencast offers instruction in using a citation management program. This assignment is usually an
alternative to an individual screencast assignment or an assignment to embed augmented reality into an infographic.

Examples of UL100 assignments incorporating data visualization and the accompanying specifications grading rubrics will be found in Appendix 1, 2, and 3.

**Adapting Multimodalities, Data Visualization, and Assessments to Individual Information Literacy Instruction Sessions**

Not every academic library has the flexibility to be able to teach a credit-bearing information literacy course, especially a course that counts for general education credit. However, it is worth investigating options for incorporating “Information Creation as a Process” into individual information literacy instruction sessions for undergraduate and graduate courses. Conversations with other teaching faculty may reveal their expectations for students to be comfortable with the creation of learning objects and the manipulation of data into charts and graphs for factual communication to a general audience.

An example of integrating “Information Creation as a Process” into individual instruction sessions is illustrated through a collaboration with the library and the ESU English Composition program. In EG102 (Composition II), students write a research paper called the Multi-Source Persuasive Essay that is due in the last third of a semester. The final project for EG102 is the student’s creation of a multimodal learning object that is based upon facts from the essay. The object can be as basic as a Powerpoint presentation or poster, or it can be a video, infographic, podcast, or another audio/video/visual project. Students are advised to think of multimodality as “the various ways (modes) of communication that we use to compose messages and create
meaning for intended audiences….You will need to think about the information you are sharing in a digital composing environment and may need to rethink your rhetorical situation (purpose, audience, context, medium) to best suit your project.”

After students submit their essays to their Composition instructors, the instructors schedule library sessions with the librarians or library graduate assistants who serve simultaneously as their library liaisons for a given semester. The session involves active learning for the students to begin identifying visual and aural elements needed in a multimodal learning object to convey the facts from the essay in a repackaged format. In the session, students are first given a handout based upon Mike Caulfield’s SIFT evaluation matrix (Stop; Investigate the Source of Information; Find Trusted Coverage; Trace Claims, Quotes, and Media Back to the Original Context.) The librarian also asks the students about their previous experiences in creating videos for YouTube or a live Facebook video, or designing infographics, flyers, Powerpoint or Prezi presentations, or similar projects. Students are then divided into pairs to work together, using the SIFT handout to evaluate two YouTube videos advertising a Ford Mustang and Doritos tortilla chips, and three visual advertisements for McDonald’s, Old Spice, and a Men’s Wearhouse ad that is from Facebook. The students share their thoughts in class about these multimodal objects in terms of facts about the items and choices of color, sound, and images selected to convey information about the items for a consumer audience. In the remaining class time, the librarian demonstrates briefly some freely available multimodal software programs, including Wix, Weebly, Piktochart, and Canva. Students are given copies of a bibliography listing these programs and others for their multimodal project, as well as another worksheet on which they list the facts from their essay to communicate effectively for visualizing data.
This instruction session, even as a more traditional “one-shot” approach, incorporates student learning outcomes of identifying various ways that information is shared in a technological society and learning how to evaluate examples of multimodalities. It also fits well with certain Knowledge Practices of “Information Creation as a Process”:

- Assess the fit between an information product’s creation process and a particular information need;
- Recognize that information may be perceived differently based on the format in which it is packaged;
- Develop, in their own creation processes, an understanding that their choices impact the purposes for which the information product will be used and the message it conveys.21

**Conclusion**

In a 2019 article about data visualization becoming an integral part of information systems curriculums, Svetlozar Nestorov, Nenad Jukic, and Sippo Rossi argue that “Data visualization plays an increasingly important role in the analytical process from basic charts and graphs that elucidate trends, patterns, and outliers, to executive dashboards and guided analytics.”22 They add that feedback from employers recruiting from their own information systems program “are increasingly listing data visualization in their internship and job postings.”23 Academic librarians are well positioned, through teaching credit-bearing courses and/or teaching embedded information literacy sessions in various disciplines, to play an especially crucial role in preparing students for a workplace environment asking or requiring
employees to translate complex data into easily understandable visual formats. As summarized in the *Framework* Introduction, “librarians, faculty, and other institutional partners [can then work] to redesign instruction sessions, assignments, courses, and even curricula; to connect information literacy with student success initiatives; to collaborate on pedagogical research and involve students themselves in that research; and to create wider conversations about student learning, the scholarship of teaching and learning, and the assessment of learning on local campuses and beyond.”

Appendix 1:

**UL100 General Infographic Assignment and Specifications Grading Assessment Rubric**

Using Piktochart or Canva, you will create an infographic based upon the topic you are researching for UL100. Use the Infographic Planning Worksheet to help you identify the purpose and audience for your infographic, as well as the facts and statistics you will highlight.

For this assignment, you will submit:

- Your infographic from Piktochart or Canva (saved as a PNG file)
- A Works Cited page of your sources used in the infographic (use APA or MLA citation style.)
These items should be turned in via a page on the website on Wix that you are constructing for your final project. You will embed the infographic as an image on a webpage on the website. The Works Cited can be presented below the image as page text or in a downloadable file. Submit the URL for this page for this assessment. The website does NOT have to be complete at this time. You just need to have some basic structure to the site, and it has to be published and accessible via a link.

INFOGRAPHIC ASSESSMENT RUBRIC:

<table>
<thead>
<tr>
<th><strong>Content:</strong> The topic is well defined and easy to understand. At least four facts relevant to the topic are included. Visual can stand alone without any more text or visuals.</th>
<th>Complete (check mark)</th>
<th>Incomplete (check mark with comments for revisions)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Graphics:</strong> Graphics relate well to the topic and make it easy to understand.</td>
<td>Complete (check mark)</td>
<td>Incomplete (check mark with comments for revisions)</td>
</tr>
<tr>
<td><strong>Mechanics:</strong> No spelling or grammatical errors.</td>
<td>Complete (check mark)</td>
<td>Incomplete (check mark with comments for revisions)</td>
</tr>
<tr>
<td><strong>Citations:</strong> Full correct citations in a consistent citation style for all sources are included. They are submitted either as text below the image, or on a separate downloadable Works Cited page.</td>
<td>Complete (check mark)</td>
<td>Incomplete (check mark with comments for revisions)</td>
</tr>
<tr>
<td><strong>Submission:</strong> Infographic is submitted via e-portfolio website.</td>
<td>Complete (check mark)</td>
<td>Incomplete (check mark with comments for revisions)</td>
</tr>
</tbody>
</table>
Appendix 2:

UL100ZA (online section) Database Demonstration with Screencasting and Specifications

Grading Assessment Rubric

Purpose of Assignment
The purpose of this assignment is to provide you an opportunity to experiment with one of the library resources in a way that will require you to identify key features of a database that go beyond the general search feature (including identifying features like the thesaurus, citation tool, filter options, etc.). This assignment also provides students the opportunity to experiment with screencasting software. Screencasting is where you record/share the content on your computer screen or phone. Ever watched someone play a video game on Twitch or watched a tutorial video for a computer software? Those users (people) are typically utilizing screencasting software to share their screens with you (and record their screens for future views).

For more information on screencasting and to preview an example of what this assignment looks like, watch my short 10-min video for this assignment. The first 3 minutes of this video cover my favorite screencasting tool, Screencastify, and the last portion of the video is an example of how to complete the database demonstration assignment:

Objective of Assignments
Students will:

- Match the information need and product to fulfill that information need with the appropriate search tool (Course Outcome 4 - ACRL Information Creation as a Process)
- Select appropriate research methods as determined by the specific information need (Course Outcome 10 - ACRL Research as Inquiry)
- View oneself as a contributor to scholarship and not just a consumer of information (Course Outcome 12 - ACRL Scholarship as Conversation)
• Identify what individuals or sources might produce information on a topic and decide how to access that information (Course Outcome 13 - ACRL Searching as Strategic Exploration)

• Select appropriate search tools that match the information need and search strategies (Course Outcome 14 - ACRL Searching as Strategic Exploration)

• Understand how information systems, such as databases and the internet, are organized and use search skills to access relevant information (Course Outcome 16)

• Use different types of searching and language and techniques appropriate to retrieve information (Course Outcome 16)

Assignment Specifications Grading Rubric (Follow These Steps)

To receive a “complete,” students should accomplish all the following steps successfully:

1. You must select a database from the A-Z List found at http://libguides.emporia.edu/az.php that relates to your research topic. Tip: Using the subject drop down menu, you can sort our database list by subject (cool, huh?!)  
2. Use any screencasting software that you are comfortable with (Jing, Panopto, Screencastify, Screencast-o-matic, etc.). If you have never experimented with screencasting software, I would recommend Screencastify (for Google Chrome users) or Screencast-o-matic. Both of these tools are FREE!

Once you have your screencasting software selected and your database picked out, begin recording your demonstration. To receive a “complete,” I’m looking for the following information to be included in your video:

1. The name of the database and why you selected it
2. Show the basic search and demonstrate using your research topic how to use the basic search
3. Show how to locate and use the thesaurus. If one isn’t available, explain how an external thesaurus might be helpful.
4. Is there an advanced search? If so, show where to find the advanced search and what the options for advanced searching are.
5. Does the database allow the use of Boolean Operators?
6. Can you filter/limit your search results by: 1) date, 2) full-text, 3) and/or peer review? If so, demonstrate where these options are.
7. How are formats displayed? (HTML, PDF, etc.)
8. Finally, share one additional feature that you like (or didn’t like) and demonstrate this feature.

Your video should include video (your desktop screen as you demonstrate) and audio (voiceover). While I always appreciate seeing your happy faces as you do these demos, you do not have to include your web camera window in this assignment.

Finally, your video should be 3-6 minutes. Embed your video into your online portfolio (under the “documents” section). For help on embedding your video to your portfolio, check out the guide here.

Example of Completed Assignment, Click Here

Tips for a Successful Recording

- Practice your demo a few times before you finally start recording. Get to know your database a little so that you aren’t “winging” it (trust me, I can tell).

- When demonstrating your searches, use the search terms from Side Quest #3.

- Don’t be nervous. I’m the only one that will be viewing this recording. Unless of course you decide to share it with others. Be proud of your work!

- Download and print this checklist to help you navigate through this demonstration quickly and easily. This checklist isn’t required but it will help ensure that you’ve met all the criteria (after all, this is the checklist I use when I grade).

- Have fun! Screencasting is the future (maybe a biased statement but look around the internet and tell me how I’m wrong). I believe that this is an essential skill in today’s technology society and am trying to use this assignment to set you up for success.

Alternative Assignment Option: Group Database Demonstration
I get it, group work isn't for everyone, especially when it comes to online classes. However, the option is available to complete this assignment as a group. To complete this assignment as a group project, you will need to complete the above specifications, in addition to:

1. Send me a quick email to let me know who will be in your group (up to three people per group)

2. Each member of the group must participate in some way toward this assignment. For example, you might consider dividing out the questions between the group members or have one person do the talking while the other navigates around the website. Overall, I expect a group submission to meet the same specifications as an individual submission.

3. When submitting the url, all members of the group must have the video embedded in their individual online portfolio (which means you might have to share the .mp4 file or url with each other). That means, if you have three members in your group, I expect to see the video embedded in all three of your portfolios.

4. A tool I recommend for web conferencing (that will also support screencasting) is Zoom which is available to all Emporia State students.

Appendix 3:

UL100D Database Poster Assignment and Specifications Grading Assessment Rubric

Purpose of Assignment

This poster is to be turned in as a part of the database group presentation. In addition to presenting an analysis of the database you were assigned, the poster will give you an opportunity to share your analysis with your peers in an attractive and concise format using an application that you are comfortable with such as Microsoft Publisher, Word, or even Piktochart. This assignment will test your ability to summarize your database analysis and to display your findings in a creative, attractive, and visually legible format while incorporating relevant images.
Objective of Assignment

Students will:

- Demonstrate effective communication skills in writing.
- Demonstrate effective communication skills in information technology.
- Assess how information products created through various processes meet their intended uses and conveyed messages.
- View oneself as a contributor to scholarship and not just a consumer of information.
- Assess content with a skeptical stance while acknowledging self-bias and personal worldview.
- Demonstrate the use of a variety of technologies and multimodal tools effectively through hands-on experience.

Assignment Specifications Grading Rubric

To receive a “Complete”, posters should include:

- Aesthetically pleasing layout and color schemes (colors should allow readability, not be harsh on the eyes).
- Easy to read text
- 1 or more images
- Name of the database and vendor
- Types of materials available

And at least three items from the following list:

- Time period covered
Subject matter of database

Intended audience of database

Number of records available

Languages available

Full-text availability

Help-guide availability and usefulness

Controlled vocabulary

User-friendliness

Advanced search features

Search fields

Boolean searching availability

Poster must be turned in as a PDF


3. "Information Creation as a Process."


7. “Studies in Literacy Genres: Comics”.


11. “Information Creation as a Process.”


17. “Information Creation as a Process.”

19. Emporia State University, Department of English, Modern Languages, and Journalism, *Writing for the Common Good: Composition II at Emporia State University* (Fountainhead Press, 2019), 205.


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Emporia State University, Department of English, Modern Languages, and Journalism. *Writing for the Common Good: Composition II at Emporia State University*. Fountainhead Press, 2019.


Stefanou, Candice R., Kathleen C. Perencevich, Matthew DiCintio, and Julianne C. Turner. “Supporting Autonomy in the Classroom: Ways Teachers Encourage Student


**Biographical Information**

Sarah Johnson is an Assistant Professor and Cataloging and Metadata Librarian in the Libraries and Archives, Emporia State University, Emporia, KS. She is responsible for providing access to library collections and for maintaining the catalog's metadata through the development and integration of policies and procedures.

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CHAPTER 11
Overcoming Intimidation: Building a Foundation for Using the Framework

Samantha Kannegiser, Dina Meky, and Amanda Piekart

Introduction

After ACRL established and implemented the Framework for Information Literacy for Higher Education in 2016, academic librarians struggled to balance flexible, nuanced theories of information literacy with practical, skills-based classroom instruction. Most librarians are familiar with the instruction scenario in which teaching faculty request a limited, one-time introduction to research or library databases (AKA the “one-shot”). In these brief sessions, many librarians have felt pressured to balance theoretical concepts and the expectations provided by teaching faculty.

Linking the Framework and Instruction

The ACRL Framework launch and subsequent publication of support materials (webinars, tutorials, etc.) prompted librarians to question how the frames could be incorporated into their instruction. The Framework was created to be open-ended and exist as guidelines rather than the skills-based approach of its predecessor (the Information Literacy Competency Standards). The Framework’s core value and appeal lay within its “… flexible options for implementation, rather than on a set of standards or learning outcomes, or any prescriptive enumeration of skills.” It establishes “threshold concepts” as an introduction to deeper learning objectives, giving its users the freedom to explore and develop their instruction under the guidance of the concepts. This lenient approach, however, can leave librarians adrift and overwhelmed. It is worth noting that the majority of the authors’ campus libraries are located in New Jersey (NJ), and in 2015 NJ librarians penned the Open Letter Regarding the Framework for Information Literacy for Higher Education imploring the Task Force in charge of developing the Framework to use the Standards “in tandem” with the Framework, particularly because NJ academic
librarians had made “significant strides” in “[integrating] information literacy (IL) competencies into curricula, and to develop structured paths as students progressed through their academic careers from community college and beyond.” Dalal (2015) credits this progress to the “outcomes-based competencies defined in the Standards.” Outside of NJ, other academic librarians had concerns regarding the Framework, such as its perceived elitism, its potentially “[diminishing] reach,” or its inability to meet the needs of community college librarians living in a “results-driven world.” Even with those with concerns, however, there is general agreement that the Framework provides an opportunity for “revisiting how we teach IL.” Our librarians shared this optimism regarding its ability to expand how we instruct while also having similar concerns regarding the Framework’s tangibility. Our goal, then, was to make this theoretical framework more concrete for our librarians while still taking the opportunity afforded by the Framework to expand the ways in which we currently teach information literacy.

At Berkeley College, librarians designed a three-step approach to visualizing Information Literacy (IL) instruction using the Framework so our librarians and teaching faculty were more at ease teaching to it. First, we built a document that organized all the Framework’s knowledge practices and dispositions into appropriate course levels for our undergraduates. Next, we used that document to create learning objects aligned with each frame and course level. These learning objects were collected into a repository and organized so that both librarians and faculty could see the ways IL frames related to typical classroom instruction, demonstrating the theory behind the skill being taught. Lastly, we redesigned our instruction tracking form to reflect the Framework and new learning objects. From data compiled from the tracking form, we were able to create visuals illustrating how information literacy was taught across disciplines and use these visuals to argue for deeper librarian involvement in classroom instruction and assignment creation. This multi-faceted approach helps us reach librarians, faculty, and other stakeholders with the goal of fully incorporating information literacy into the curriculum.

Visualizing The Framework through a Coded Document

Berkeley College’s Instructional Services Committee (ISC, comprising all Research and Instruction Librarians across eight campuses) decided to create a coded document (see Appendix A), the first step in mapping our curriculum to the Framework’s knowledge practices and dispositions. We wanted to see which of those concepts we were teaching, and at what course level. We used a deductive analysis method in which our codes were predetermined (introductory, intermediate, or advanced) and defined (introductory was applicable to 100 level classes, intermediate for 200 and 300 level classes, and advanced for 400 level classes and graduate classes). At the time, the committee was comprised of five librarians, each of whom individually read through the Framework and coded each knowledge practice and disposition as either introductory, intermediate, or advanced, based on our experiences teaching these course
levels with Berkeley College students. Later, the group came together for a norming session to review individual codes, discuss any discrepancies, and come to an agreement on the final code given to each item.

The coded document took time to organize. With the frames frequently overlapping, and concerns of the Framework’s vagueness from other librarians, it was imperative that this document be built with clarity in mind. We wanted the Framework to be sorted into teachable levels, to be easily applied to classroom instruction. For example, if teaching the research process to our students, instruction could focus on the development of a search strategy. The most obvious frame in this instance would be “Searching as Strategic Exploration,” but this instruction could also include knowledge practices and dispositions from other frames, such as “Research as Inquiry.” For example, the following knowledge practices could potentially be taught when teaching search strategy development: 1. “Use various research methods, based on need, circumstance, and type of inquiry” (Research as Inquiry) and 2. “Understand how information systems...are organized in order to access relevant information” (Searching as Strategic Exploration). Both of these are relevant to the task of teaching students to create a search strategy, but our group determined that at the 100 and 200 course level, students could be taught and employ various research methods, but they may be overwhelmed when connecting those methods to the ways in which information systems are organized, a concept which we determined was better taught at an intermediate level. Therefore, if a librarian needs to teach students in an introductory course, our document would give them a tool to link the knowledge practices and dispositions from several different frames to their lesson plan. The structure and coding in the coded document also helped our librarians overcome the ambiguity of the Framework and show its application using concrete teaching examples in our instruction program.

**Creating a Bridge between Theory and Practice: The Learning Object Repository**

To capitalize on the coded document, ISC librarians decided to create a learning object repository. Information Literacy is one of six college learning objectives for all of Berkeley College’s academic programs; all faculty are expected to incorporate information literacy instruction into the curriculum. As the experts on information literacy, librarians needed a way to share this expertise with faculty who want to integrate these concepts into their teaching outside of formal library instruction. Our librarians want to work directly with faculty in their courses, but we also want to promote faculty independence in teaching information literacy. Additionally, we have found that our faculty sometimes equate information literacy with in-class research
instruction, and we wanted to encourage an expansion of this to include the more advanced concepts referenced in the Framework.

We decided that a learning object repository would help us visualize a cohesive balance between theoretical context of information literacy concepts and the concrete skills that college students need to learn to successfully complete course assignments. Bridging the gap between information literacy theory and assignment-level research skills was a necessary way for us to explore the affordances of the Framework and honor the requests of our faculty and immediate needs of our students. Using the coded document as a map, we created our IL Learning Object Repository, known as the “ILLO.” Other repositories like this exist, namely the ACRL Sandbox and Project CORA, both of which our librarians use for inspiration and instruction. Our goal was to create something college-specific that showcased our librarians’ expertise to faculty, provided content useful to our college’s programs, and served as space for our librarians to submit their own work and share materials as a group.

A subcommittee of four ISC librarians created the ILLO. We wanted a strong foundation of learning objects that would be applicable to a variety of disciplines and courses, both on-site and online. Designed to be immediately useful to librarians and faculty, we planned to build on this foundation over time. Some of the initial learning objects came from materials we already used in our instruction; others were new, original creations based on concepts we knew would be useful to the college; and some were adapted and credited from existing outside materials. These learning objects included lesson plans, presentations, videos, articles, activities, and assessment tools. Each material was tagged with the relevant ACRL frame(s) to help with organization.

Making it Accessible and Intuitive: Building the Repository

For the ILLO to be successful, it was important that we designed and organized it with librarians and faculty in mind, which echoes Latham, Gross, and Julien’s conclusion that “a full implementation of the Framework may require more collaboration between librarians and faculty in embedding these concepts into coursework.” Our faculty are likely to request skills-based instruction directly related to the research process or a class assignment. Librarians are eager to connect these instruction requests to concepts in the Framework, but may have difficulty aligning skills with frames. To accommodate both ways of thinking and encourage collaboration, the ILLO is organized with multiple access points: users can browse learning objects available for each frame, or search more directly for a specific skill, such as evaluating sources. For example, a user can select a specific concept or skill they want to teach, such as “credibility,” from a drop-down menu. This will take them to a learning object aligned with the frame
“Authority is Constructed & Contextual,” which bridges a practical skill and an overarching concept (see Figure 1). Under “determining credibility,” there is an article for students to read discussing how authoritativeness looks different for different communities, and an assignment for which students identify both an authoritative “influencer” and an authoritative “expert” for their research topic (see Figure 2). Faculty can assign students to read the theoretical background before class and then, in class, complete the skills-based assignment illustrating the theoretical concept [see Figure 3]. This strategy is reflective of Latham, Gross, and Julien’s study of instruction librarians, which found that they “are using the frames as a subtext for teaching while still providing primarily skills-based instruction” and more heavily using the “flipped classroom” model”.
Figure 1: ILLO Drop-down menu
Figure 2: “Determining Credibility” learning object from the ILLO
Figure 3: Flipped Classroom Model

1. **Before class, students read content on information literacy concept**
2. **In class, students complete active learning assignment that illustrates theoretical content and teaches skills**
3. **Professor determines which information literacy concept to teach and at which level**
4. **Professor chooses a lesson plan and assignment from the ILLO**

The cycle continues as indicated by the arrows.
Continuing the ILLO: Future Plans and Sustainability

Sustainability of the repository is a concern, and we are working to ensure that the ILLO does not become outdated or incorrect with time. We have encouraged new submissions from all librarians by showcasing their work in an internal newsletter and introducing ILLO submissions as an annual goal for performance reviews. To maintain the quality of submissions in the repository, we developed a unique rubric (see Appendix B) to assess the learning object and determine whether the instruction design and outcomes are well-suited for the collection. Additionally, we developed a marketing plan which included highlighting ILLO submissions in a newsletter, adding a link to the ILLO in email signatures, including a paragraph on the ILLO in liaison emails, and talking about it with faculty in casual conversation. The ILLO is still in its early stages, but our hope is that with a concentrated marketing and development efforts, it will become a necessary resource for librarians and faculty in creating courses, lesson plans, and assignments.

Tracking the Impact of Framework: Changes to Assessment Methods and Practices

Our final stage in adapting the Framework to our information literacy instruction involved a change in the way we track our teaching. Berkeley College librarians have been recording their information literacy instruction since 2009. Originally, we used an Excel spreadsheet to list the course we supported and the ACRL Standards and performance indicators that were taught in that course. Seven years later, we acquired Springshare’s LibInsight platform and automated our instruction tracking; this offered the ability to easily generate reports, graphs, and cross-data analysis.

Librarians were initially required to fill out the following information: course number, date, contact method, ACRL frame taught, type of instruction provided, assessment method, and assessment results. The form largely remained the same until the Instructional Services Committee began an in-depth assessment project using its data. ISC quickly learned that the form fields in the tracking document left a lot open for interpretation. Because we only asked what frame was taught, we were unable to determine which specific knowledge practices or dispositions were being taught within the frames. In order to improve our ability to share meaningful data, we revised our tracking form, incorporating the coded skills document we adapted from the Framework into the form. With this improvement, we have been able to easily share and use the data in meaningful ways. So far, we know the following:
● “Research as Inquiry” and “Searching as Strategic Exploration” are our most taught frames [see Figure 4];

● “Scholarship as Conversation” and “Authority is Constructed and Contextual” are our least taught frames [see Figure 4];

● We are mostly providing instruction on what we have coded as introductory-level information literacy skills, regardless of the level of the courses in question.

We believe “Research as Inquiry” and “Searching as Strategic Exploration” are the most popular frames we teach in the classroom because they easily align with teaching students how to plan and conduct research for their assignments. Specifically both of these frames cover basic concepts such as determining scope of research, refining research results, and managing search results. We also know that our professors want their students to understand what a scholarly source is and how to locate one, but they do not provide librarians enough time in the classroom to cover these topics and the “how-to” instruction needed to complete their assignment. Another challenge to teaching “Authority is Constructed and Contextual” is that professors put limitations on the types of sources they will accept from students and therefore it makes it a challenge for librarians to teach students the value of developing their own authoritative voice or how to question traditional notions of authority. In Latham, Gross and Julien’s study, time in the classroom to teach higher-order thinking skills is a challenge that many librarians face.
We have also been able to filter our data by academic department. This has allowed us to have honest conversations with faculty on what type of information literacy instruction is and is not happening in their departments [see Figure 5]. In 2018, we met with our Fashion Department chair and shared our analysis of how we had supported the fashion department with IL instruction over the past two years. During this meeting, we demonstrated that there was no evidence of progressive skill-building; many of the upper-level course research assignments did not lend themselves to more advanced skills/knowledge practices/dispositions [see Figure 6]. Having this data opened the door for us to make recommendations on what courses and assignments we thought might be a good fit for more advanced information literacy instruction. Our recommendations to the fashion department were well received: we moved forward with a plan to target courses that would ensure a more balanced approach to integrating information literacy into the fashion program. We plan to continue with this approach of using our data—or the lack thereof—to meet with department chairs and share our insights and recommendations.
Figure 5: Number of classes that received information literacy instruction by department in Fall 2017
Demonstrating our Value: Using the Data from the Tracking Form

Within our Library department, we have used the data from the IL tracking form to create reports demonstrating distribution of instruction among librarians; instruction workload by month; most and least popular types of support (see Figure 7); and types of assessment tools used (see Figure 8). All of these data points have allowed the library to reflect and improve on our instructional services. Recently, we have started to assign classes to ensure an even workload. We have also started to look at least-used types of support and assessment strategies, and will create training focused on increasing librarians’ skills and confidence in these areas.

Figure 6: Information Literacy concepts taught in Fashion classes by level in Fall 2015 through Fall 2017

Figure 7: Types of instructional support given by librarians in Fall 2017
Figure 8: Types of assessment tools used by librarians in Fall 2017

Conclusion

While many libraries still struggle to implement the ACRL Framework, Berkeley College has taken several proactive steps to overcome this challenge and embrace the opportunities it provides. Our three-step approach of creating a skills document, developing the Information Literacy Learning Object repository, and using specialized reports from LibInsight has allowed us to help multiple stakeholders visualize the frames in a way that makes sense to them. Since implementation of the skills document, librarians have demonstrated that it has been an effective way for them to articulate the specific IL skills being taught. The ILLO will allow faculty to confidently implement information literacy into their course, with or without a librarian. Lastly, our changes to the IL tracking form and its resulting reports continue to open doors to conversations on authentically integrating information literacy at Berkeley College.
Appendix A: Coded Document of Framework as Beginner, Intermediate, or Advanced
<table>
<thead>
<tr>
<th>Authority Is Constructed and Contextual</th>
<th>Introductory (1000 level)</th>
<th>Intermediate (2000 &amp; 3000 level)</th>
<th>Advanced (4000 level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>define different types of authority, such as subject expertise (e.g., scholarship), societal position (e.g., public office or title), or special experience (e.g., participating in a historic event); (AKPIntro1)</td>
<td>understand that many disciplines have acknowledged authorities in the sense of well-known scholars and publications that are widely considered “standard,” and yet, even in those situations, some scholars would challenge the authority of those sources; (AKPIntera1)</td>
<td>understand the increasingly social nature of the information ecosystem where authorities actively connect with one another and sources develop over time; (AKPIntera1)</td>
<td></td>
</tr>
<tr>
<td>use research tools and indicators of authority to determine the credibility of sources, understanding the elements that might temper this credibility; (AKPIntro2)</td>
<td>acknowledge they are developing their own authoritative voices in a particular area and recognize the responsibilities this entails, including seeking accuracy and reliability, respecting intellectual property, and participating in communities of practice; (AKPIntera2)</td>
<td>question traditional notions of granting authority and recognize the value of diverse ideas and worldviews; (ADA1)</td>
<td></td>
</tr>
<tr>
<td>recognize that authoritative content may be packaged formally or informally and may include sources of all media types (AKPIntro3)</td>
<td>develop and maintain an open mind when encountering varied and sometimes conflicting perspectives; (AKPIntera3)</td>
<td>are conscious that maintaining these attitudes and actions requires frequent self-evaluation; (ADA2)</td>
<td></td>
</tr>
<tr>
<td>motivate themselves to find authoritative sources, recognizing that authority may be conferred or manifested in unexpected ways; (AKPIntro4)</td>
<td>develop awareness of the importance of assessing content with a skeptical stance and with a self-awareness of their own biases and worldview; (ADA1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introductory (1000 level)</td>
<td>Intermediate (2000 &amp; 3000 level)</td>
<td>Advanced (4000 level)</td>
<td></td>
</tr>
<tr>
<td>assess the fit between an information product’s creation process and a particular information need; (ICPKPIntro1)</td>
<td>articulate the capabilities and constraints of information developed through various creation processes; (ICPKPIntera1)</td>
<td>transfer knowledge of capabilities and constraints to new types of information products; (ICPKPA1)</td>
<td></td>
</tr>
<tr>
<td>recognise the implications of information formats that contain static or dynamic information; (ICPKPIntro2)</td>
<td>articulate the traditional and emerging processes of information creation and dissemination in a particular discipline; (ICPKPIntera2)</td>
<td>develop, in their own creation processes, an understanding that their choices impact the purposes for which the information product will be used and the message it conveys; (ICPKPA2)</td>
<td></td>
</tr>
<tr>
<td>Information Creation as a Process</td>
<td>Introductory (1000 level)</td>
<td>Intermediate (2000 &amp; 3000 level)</td>
<td>Advanced (4000 level)</td>
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<tr>
<td>are inclined to seek out characteristics of information products that indicate the underlying creation process. (CPDIntro1)</td>
<td>recognize that information may be perceived differently based on the format in which it is packaged. (CPKIntro3)</td>
<td>accept that the creation of information may begin initially through communicating in a range of formats or modes. (CPDIntro2)</td>
<td>monitor the value that is placed upon different types of information products in varying contexts. (CPKIntro4)</td>
</tr>
<tr>
<td>value the process of matching an information need with an appropriate product. (CPDInter1)</td>
<td>accept the ambiguity surrounding the potential value of information creation expressed in emerging formats or modes. (CPDInter2)</td>
<td>resist the tendency to equate format with the underlying creation process. (CPDInter3)</td>
<td>understand that different methods of information dissemination with different purposes are available for their use. (CPKInter4)</td>
</tr>
<tr>
<td>Introductory (1000 level)</td>
<td>Intermediate (2000 &amp; 3000 level)</td>
<td>Advanced (4000 level)</td>
<td></td>
</tr>
<tr>
<td>give credit to the original ideas of others through proper attribution and citation. (VKIntro1)</td>
<td>articulate the purpose and distinguishing characteristics of copyright, fair use, open access, and the public domain. (VKInter1)</td>
<td>understand how and why some individuals or groups of individuals may be underrepresented or systematically marginalized within the systems that produce and disseminate information. (VKPA1)</td>
<td></td>
</tr>
<tr>
<td>understand that intellectual property is a legal and social construct that varies by culture. (VKIntro2)</td>
<td>see themselves as contributors to the information marketplace rather than only consumers of it. (VDIntro1)</td>
<td>understand how the commodification of their personal information and online interactions affects the information they receive and the information they produce or disseminate online. (VKPA2)</td>
<td></td>
</tr>
<tr>
<td>Research as Inquiry</td>
<td>Introductory (1000 level)</td>
<td>Intermediate (2000 &amp; 3000 level)</td>
<td>Advanced (4000 level)</td>
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</tr>
<tr>
<td>give credit to the original ideas of others through proper attribution and citation (IVKIntro1)</td>
<td>formulate questions for research based on information gaps or on reexamination of existing, possibly conflicting, information (IRKIntro1)</td>
<td>value intellectual curiosity in developing questions and learning new investigative methods (RIPKA1)</td>
<td></td>
</tr>
<tr>
<td>respect the original ideas of others (IVKIntro2)</td>
<td>deal with complex research by breaking complex questions into simple ones, limiting the scope of investigations (RIPIntro2)</td>
<td>demonstrate intellectual humility (i.e., recognize their own intellectual or experiential limitations) (RIDA1)</td>
<td></td>
</tr>
<tr>
<td>decide where and how their information is published (IVKIntro3)</td>
<td>use various research methods, based on need, circumstance, and type of inquiry (RIPIntro3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>value the skills, time, and effort needed to produce knowledge (VCDIntro4)</td>
<td>monitor gathered information and assess for gaps or weaknesses (RIPIntro4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research as Inquiry</td>
<td>draw reasonable conclusions based on the analysis and interpretation of information (RIPIntro5)</td>
<td>organize information in meaningful ways (RIPIntro5)</td>
<td></td>
</tr>
<tr>
<td>appreciate that a question may appear to be simple but still disruptive and important to research (RDIIntro1)</td>
<td>seek appropriate help when needed (RDIIntro2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>scholarship as conversation</td>
<td>introductory (1000 level)</td>
<td>intermediate (2000 &amp; 3000 level)</td>
<td>advanced (4000 level)</td>
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</tr>
<tr>
<td>follow ethical and legal guidelines in gathering and using information (RIIntro3)</td>
<td>value persistence, adaptability, and flexibility and recognizes that ambiguity can benefit the research process (RIInter2)</td>
<td>seek multiple perspectives during information gathering and assessment (RIInter3)</td>
<td></td>
</tr>
<tr>
<td>cite the contributing work of others in their own information production (SCKIntro1)</td>
<td>identify barriers to entering scholarly conversation via various venues (SOPInter1)</td>
<td>seek out conversations being place in their research area (SCDA1)</td>
<td></td>
</tr>
<tr>
<td>contribute to scholarly conversation at an appropriate level, such as local online community, guided discussion, undergraduate research journal, conference presentation/poster session (SCKIntro2)</td>
<td>summarize the changes in scholarly perspective over time on a particular topic within a specific discipline (SCKIntro2)</td>
<td>suspend judgment on the value of a particular piece of scholarship until the larger context for the scholarly conversation is better understood (SCDA2)</td>
<td></td>
</tr>
<tr>
<td>critically evaluate contributions made by others in participatory information environments (SCKIntro3)</td>
<td>recognize that a given scholarly work may not represent the only or even the majority perspective on the issue (SCKIntro3)</td>
<td>recognize that systems privilege authorities and that not having a fluency in the language and process of a discipline disempowers their ability to participate and engage (SCDA3)</td>
<td></td>
</tr>
<tr>
<td>identify the contribution that particular articles, books, and other scholarly pieces make to disciplinary knowledge (SCKIntro4)</td>
<td>recognize they are often entering into an ongoing scholarly conversation and not a finished conversation (SCDIntro1)</td>
<td></td>
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</tr>
<tr>
<td>recognize that scholarly conversations take place in various venues (SCDIntro1)</td>
<td>see themselves as contributors to scholarship rather than only consumers of it (SCDIntro1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>understand the responsibility that comes with entering the conversation through participatory channels (SCDIntro2)</td>
<td>value user-generated content and evaluate contributions made by others (SCDIntro3)</td>
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<td></td>
</tr>
</tbody>
</table>

<p>| introductory (1000 level) | intermediate (2000 &amp; 3000 level) | advanced (4000 level) |</p>
<table>
<thead>
<tr>
<th>Searching as Strategic Exploration</th>
<th>Determine the initial scope of the task required to meet their information needs (SEKPintr1)</th>
<th>Utilize divergent (e.g., brainstorming) and convergent (e.g., selecting the best source) thinking when searching (SEKPintr1)</th>
<th>Understand how information systems (i.e., collections of recorded information) are organized in order to access relevant information (SEKPA1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify interested parties, such as scholars, organizations, governments, and industries, who might produce information about a topic and then determine how to access that information (SEKPintr2)</td>
<td>Design and refine needs and search strategies as necessary, based on search results (SEKPintr2)</td>
<td>Recognize the value of browsing and other serendipitous methods of information gathering (SEDEA1)</td>
<td></td>
</tr>
<tr>
<td>Match information needs and search strategies to appropriate search tools (SEKPintr3)</td>
<td>Manage searching processes and results effectively (SEKPintr3)</td>
<td>Persist in the face of search challenges, and know when they have enough information to complete the information task (SEDEA2)</td>
<td></td>
</tr>
<tr>
<td>Use different types of searching language (e.g., controlled vocabulary, keywords, natural language) appropriately (SEKPintr4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibit mental flexibility and creativity (SEDEIntro1)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Understand that first attempts at searching do not always produce adequate results (SEDEIntro2)</td>
<td></td>
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</tr>
<tr>
<td>Realize that information sources vary greatly in content and format and have varying relevance and value, depending on the needs and nature of the search (SEDEIntro3)</td>
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<tr>
<td>Seek guidance from experts, such as librarians, researchers, and professionals (SEDEIntro4)</td>
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</table>

**Appendix B: ILLO Rubric**
# ILLO Rubric

This rubric assesses the information literacy learning objects submitted for inclusion in the ILLO LibGuide based on their content, alignment to the Framework, accessibility, assessment tools, and overall design.

**Content**: Resources should not be dated in content, language, or visuals. Content should not include outdated information, errors, improper use of data, or inaccurate displays of data. Content should support Berkeley College curriculum. Content should satisfy learning objectives with an appropriate level of detail and level of difficulty for the intended audience.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Level 0 (0 pts)</th>
<th>Level 1 (1 pt)</th>
<th>Level 2 (2 pts)</th>
<th>Level 3 (3 pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Currency, Accuracy, &amp; Bias</strong></td>
<td>The content is inaccurate, outdated, or shows bias.</td>
<td>Most of the content is outdated, inaccurate, or misleading.</td>
<td>Most of the content is current, accurate, and fairly presented. Minor edits may be needed.</td>
<td>All of the content is accurate, current, and free of bias, or shows a bias for the purpose of meeting a stated learning outcome.</td>
</tr>
<tr>
<td><strong>Scope &amp; Skill Level</strong></td>
<td>The content attempts to cover far too much or too little information or is inappropriate for the stated skill level.</td>
<td>The content covers just enough information to teach the concept and is somewhat appropriate for intended skill level. Does not offer opportunities for advancement.</td>
<td>The content moderately covers the stated concept and is mostly appropriate for intended skill level. Needs editing and elaboration.</td>
<td>The content is perfectly appropriate in scope for the stated concept and intended skill level.</td>
</tr>
<tr>
<td>Reusability &amp; Adaptability</td>
<td>The content is not applicable to Berkeley College curriculum and/or cannot be adapted for different environments.</td>
<td>The content is not applicable to more than one assignment, course, or subject and is not easily adaptable for different environments.</td>
<td>The content is applicable to at least two assignments, courses, and/or subjects and can be adapted to other subjects with editing.</td>
<td>The content is applicable to more than two courses, assignments, or subjects and is easily adaptable for different environments.</td>
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</table>

**Framework Aligned:** The learning object is aligned with the Framework for Information Literacy for Higher Education with specific frames, knowledge practices/dispositions. The aligned knowledge practices/dispositions are appropriate for the intended audience based on the Skill Level Document.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Level 0 (0 pts)</th>
<th>Level 1 (1 pt)</th>
<th>Level 2 (2 pts)</th>
<th>Level 3 (3 pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frames, Knowledge Practices, &amp; Skill Level Document</td>
<td>The learning object is not aligned to the framework and cannot be aligned because it is irrelevant to information literacy instruction.</td>
<td>The learning object could be aligned to one or more frameworks and knowledge practices, but this is not made clear in the documentation for the learning object.</td>
<td>N/A</td>
<td>The learning object is clearly aligned to frame(s) and accordant knowledge practices. The aligned knowledge practices are appropriate for the skill level.</td>
</tr>
<tr>
<td>Learning Objectives</td>
<td>There are no stated learning objectives.</td>
<td>There is a learning objective which is not aligned to framework or does not align to learning objective content.</td>
<td>N/A</td>
<td>There is a learning objective(s) which align with the framework. The learning object meets the stated learning objective(s).</td>
</tr>
</tbody>
</table>

**Assessment:** Learning Object should include at least one assessment tool, method or suggestion for development of assessment method to gather qualitative and qualitative data to align with Berkeley College Libraries' assessment goals. The assessment method should be appropriate to the content, well-rounded and adaptable to multiple subjects and learning environments.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Level 0 (0 pts)</th>
<th>Level 1 (1 pt)</th>
<th>Level 2 (2 pts)</th>
<th>Level 3 (3 pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included/Not Included</td>
<td>Included</td>
<td>Assessment Plan</td>
<td>Option or Suggestion</td>
<td>Development</td>
</tr>
<tr>
<td>----------------------</td>
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</tr>
<tr>
<td>Type of Assessment Appropriate to Content</td>
<td>Included</td>
<td>Assessment Plan</td>
<td>Option or Suggestion</td>
<td>Development</td>
</tr>
<tr>
<td>Adaptable to multiple environments</td>
<td>No assessment plan included.</td>
<td>Potential to develop assessment plan and its creator has included suggestions for potential assessment methods.</td>
<td>There is potential to develop an assessment plan and its creator has included suggestions for potential assessment methods.</td>
<td>There is an assessment method that can be used in some classroom environments. Can be used in some subjects but needs editing and development.</td>
</tr>
</tbody>
</table>

**Materials Design:** The learning object should be organized in a coherent manner that demonstrates content organization, intentional choice of visuals, does not include errors, and incorporates several universal design principles.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Level 0 (0 pts)</th>
<th>Level 1 (1 pt)</th>
<th>Level 2 (2 pts)</th>
<th>Level 3 (3 pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universal Design Principles</td>
<td>No evidence of accessibility features present.</td>
<td>2 enhanced accessibility feature present.</td>
<td>3 enhanced accessibility features present.</td>
<td>4 or more Highly accessible features present.</td>
</tr>
<tr>
<td>Content Flow</td>
<td>No evidence that content is organized in a purposeful way.</td>
<td>Resources are disorganized but there is evidence of segments (i.e., clear beginning, middle and end) and is not self-explanatory.</td>
<td>Resources are organized in a meaningful way, however, there is no explanation for users utilizing the material on their own - needs to be facilitated by an instructor.</td>
<td>Resource highly organized. It is well segmented, provides easy transitions between topics and self-explanatory.</td>
</tr>
<tr>
<td><strong>Grammar, Punctuation, &amp; Spelling</strong></td>
<td>Significant evidence of mechanical and grammatical errors are present in learning object.</td>
<td>Some evidence of mechanical and grammatical errors are present in learning object.</td>
<td>Minor evidence of mechanical and grammatical errors are present in learning object.</td>
<td>Learning object is free from mechanical and grammatical errors.</td>
</tr>
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<td>-------------------------------------</td>
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</tr>
<tr>
<td><strong>Format</strong></td>
<td>No evidence of format.</td>
<td>Some evidence of format is present however it is not uniformed or consistent. (i.e., font sizes, background design, size of images etc.).</td>
<td>Evidence of format is present but could be improved.</td>
<td>Evidence of format is present and consistent. It does not distract from the learning process.</td>
</tr>
<tr>
<td><strong>Visuals</strong></td>
<td>No evidence of visuals.</td>
<td>Visuals are not conducive to the learning process. (i.e., visuals are not understandable or not of high quality.</td>
<td>Evidence of visuals are present but could be improved.</td>
<td>Visuals accurately support the course and instruction objectives.</td>
</tr>
</tbody>
</table>
Notes


Bibliography


Biographies

Samantha Kannegiser is the Student Success Librarian at Rutgers University-Camden. In this role, she forms partnerships with other campus departments, provides instruction, and plans programs to increase outreach to students. Her research interests include the ways librarians can use technology, such as virtual reference services, online instructional services, and emerging technologies such as augmented reality and virtual reality, to engage and teach students.

Dina Meky is the Global Campus Outreach and Online Learning Librarian at Northeastern University. She is responsible for providing online instruction and services to a variety of programs and satellite campuses, outreach programming, and creating deeper learning opportunities for distance learners. Her research interests include diversity in librarianship, outreach and advocacy in information literacy, and digital pedagogy.

Amanda Piekart Primiano is the Director of Research and Instructional Services at Berkeley College. In her role, Amanda provides leadership and strategic direction to the library’s instructional services program, and oversees the design, development and implementation of library instructional resources in order to increase the libraries capacity as academic partner in the development of engaged, critical and self-directed learners. Her interests include information literacy, assessment, instructional design and professional development.
CHAPTER 12

Visualizing Play and Playgrounds in Order to Understand the Framework

Shelley Harper

Betsy A. Tuma, Illustrator

“Play is the only way the highest intelligence of humankind can unfold.”

-Joseph Chilton Pearce

Introduction

In an information literacy instruction session, first year students are not listening to a lecture. Instead, they are in small groups and the noise level is high. They are playing a modified game of charades. One student has a card explaining a research tool in the library. The student tries to get the rest of the group to guess what the tool is. “Three syllables, first syllable. Meow!” says the student. “Cat,” says a colleague. The group identifies the tool as a catalog, but they have one more step to do. This charades game requires them to invent a tagline for the tool that summarizes what the tool does. Ideas go back and forth and then the group settles on “Geographic Positioning System (GPS) for library materials.”

The students are actively engaged and are using play to learn about information literacy. Play is a powerful learning modality and this chapter will demonstrate how it can be used for learning
The concepts of the Framework for Information Literacy for Higher Education. In this case, applying play to the Framework rests upon using a metaphor of playing in a playground. Visualizing the play happening within a playground creates mental constructs that can help both librarians and students learn the content of the Framework. The playground corresponds to the Framework’s threshold concepts and play represents the Framework’s Knowledge Practices and active learning techniques. By playing in the Framework, teaching librarians can increase their understanding, develop active learning teaching plans, and rehearse their instruction of its content. Finally, students can play through the librarians’ teaching playgrounds to improve their information fluency.

A note about terms used in this chapter. Most discussions of play focus on young children. When scholars started examining adults and play, especially in the fields of education and psychology, they differentiated their work from that of early-education scholars by using the phrase “adult play.” Since this work focuses on higher education, it will use the term “adults” for undergraduates.

We will begin by defining “play” and “playground” and then link the definitions to the scholarly literature. Next, the chapter explains the play and playground metaphor in detail. Finally, it shows how the metaphor can be applied to the Framework to enable learning by both librarians and their students.

Defining Play & Playground

Play

What is play and how does it relate to adult learning? Answering that question can be difficult. Play, being both fundamental to human experience and complex, is hard to define.
Michael Buckland[2] explored the definition of “information” and found widely different meanings; likewise, scholars define play in a variety of ways. Consider this general description of adult play: “Participants in a play activity construct their own knowledge by testing ideas and concepts based on prior schema, applying these to new situations, risking innovations, and then attempting to piece together and integrate the new knowledge.”[3] From this description we learn some key aspects of play. It is an activity, something that is done rather than consciously thought about. It takes place in a separate space conducive to using imagination. Finally, the process of playing helps to create personal meaning for the new ideas that playing produced.

To further distill the definition of adult play down to its core characteristics I considered scholarship from education, psychology, and information studies. All three disciplines described play as an ideal environment for learning, and they identified three specific qualities of adult play. It allows for experimentation and rehearsal; it is creative; and it makes the abstract concrete.

*Play as Experimentation and Rehearsal*

Experimentation reveals how well variables work together, as can be seen when a web designer in a tech sandbox tries various color palettes. Rehearsal, meanwhile, happens in a low-stakes arena and involves repetition that leads to refined performances, skills, or procedures. Both experimentation and rehearsal require space that is set apart from the real world and its consequences.

For spontaneity and unselfconsciousness to emerge, play cannot incur judgement or punishment. Psychologist Adam Blatner describes this other-worldly realm of play as follows:

> Another element includes playfulness, a sense of tentative openness, that is part of an improvised exploration. This playfulness encourages trust, because a given
[activity] can be viewed as a rehearsal, not as something that counts. The mixture of trust-building activities and playfulness is needed because improvisational . . . playing can only emerge spontaneously in contexts that have low-anxiety.[4]

David Tanis also links play with spontaneity. He describes three kinds that are promoted by play. “Physical spontaneity is characterized by exaggerated movement, animated gestures or facial expressions, and an eagerness to be involved physically. Social spontaneity is demonstrated by individuals who pursue interactions with others. Cognitive spontaneity is marked by curiosity, inventiveness, imagination, and thinking outside the box.”[5] These versions of spontaneity enable experimentation, and that in turn leads to the repeated iterations of rehearsal. Play creates the imaginative, judgment-free space needed for experimentation and rehearsal.

While a person can play alone, often people play together in groups. Group work is common in higher education and is used to promote collaboration and the synergy that comes from sharing ideas. Group play adds to that list space for experimenting with and rehearsing the social dynamics of groups.

Multi-person play brings complex social interaction into the open,[6] making them available for learning. For instance, play that incorporates social role taking or conflict simulation will require role swapping and listening to how others think and feel. This can build mutual understanding and empathy. “The presence of more than two people [in a play scenario] . . . optimize[s] the flow of creative juice in . . . intrapersonal dynamics.”[7]

Play is Creative
“Creativity is ‘our ability to play with ideas, thoughts, possibilities, and materials,’ as defined by Danish researcher in innovation, Lotte Darso.”[8] Play contributes to creativity in its use of imagination and generation of fresh ideas.

The work of psychologist Joseph Moreno (1889-1974) illustrates the connection between play and creativity. Moreno developed his treatment method known as psychodrama after observing children playing in a playground.[9] He was particularly intrigued by the children’s spontaneity and their unselfconscious manner of interacting and solving problems. Psychodrama creates a playground in which adults can be innovative and creative. “One of Moreno’s more perceptive insights was that creativity usually doesn’t blossom from quiet contemplation, but rather most often emerges from an active involvement in an exploratory process, a creative process, an improvisation.”[10]

Bateson writes about playfulness and creativity by describing a research survey he and his colleague conducted using a general population. They found that people who regarded themselves as playful “were much more likely to give lots of [creative] answers” to the survey [scenarios].[11] Their research supports the connection between play and creativity, as did Moreno’s work.

*Play Makes the Abstract Concrete*

In order to teach playfully, I sometimes bring a large, unsorted pile of books to a class receiving library instruction. I ask for a volunteer student to find a book of a certain title in the pile. The student must pick up each book, look at its title, and repeat the process if the book in hand is not the required title. We discuss searching by title and sort the books by title alphabetically. Then I ask for a volunteer student to find a book by a particular author. The
students understand, after searching through the books again, that they may need different access points to find something in a collection of information. They might know an author’s name or a title and will need search routes for both. The experiential, physical nature of this exercise integrates mind, emotion, and body and results in lasting learning. The exercise made the abstract concept of access points concrete and understandable, and it shows how a game can lead to deep learning.

Another way to describe how play makes abstract concepts tangible is to say that play-based learning is well suited to combining theory with practice. Wrenn and Wrenn describe the value of teaching theory and practice at the same time.

One of the authors draws from her clinical experience in counseling while illustrating the value of theory in the classroom. She finds that student interest is more strongly piqued through these anecdotal experiences than through the use of textbook vignettes. For example, sharing her experience as a grief counselor and grief group facilitator brings to life the grieving experiences of people in need. By sharing one’s on-going current experiences with students, the instructor heightens their interest and increases the relevance of the material. Students are able to ask questions such as “How did you handle that?” and the teacher can ask, “What would you do in a case like that?” In this way, the theory becomes clearer and more easily applicable to the real cases they face in a [real-life] situation. [12]

Learners, including adults, benefit from understanding why they are learning. When they grasp the “why” they are well prepared to grasp the “what.” Connecting theory and practice can make complex concepts clear.

**Playground**

What is a playground, exactly, be it real or metaphorical? Does it matter what it is made of? Does it have to be brightly painted and look inviting? Can it be empty? People create all kinds of playgrounds to accommodate every imaginable kind of play. A playground can be a concrete
basketball court, a plain cardboard box, or an amusement park. Physical characteristics matter less than functional attributes. To promote play, a playground has to use its space to make play possible. Playgrounds enable spontaneity while withholding judgement so that people can play safely. They have boundaries that keep some things in and other things out. The boundaries make it possible for people to focus on their play. Finally, playgrounds invite activity and use of imagination by providing things or ideas to play with. Playgrounds are equipped with physical things or metaphorical concepts, like swings or riddles.

**Playgrounds Are Safe**

Play spaces can be laboratories or rehearsal halls for experimentation if the players feel safe there. To challenge limits, to rehearse novelty, and to improvise solutions requires safety. The people who will do these things put themselves at risk by trying something new, even if they risk only their perceptions of themselves.

Playgrounds must be free from ridicule, censure, punishment and other forms of judgement in order to support spontaneity and learning. "Spontaneity involves imagination, and this dynamic is inhibited in states of anxiety, fatigue, anger and other ‘emergency’ emotions. It requires a receptive state, a sense of safety, such as that ideally provided by the context of non-competitive play."[13]

Safe playgrounds make possible another important characteristic of learning. Players who feel safe may be willing to let go of the perceived right answer. Andrew Walsh, a British librarian studying the convergence of play and learning, uses play to help students break free from telling teachers what they think the teachers want to hear. He uses play to create a more inquisitive environment. “So how can students be supported to switch from a ‘black and white’ point of view, to one composed of a kaleidoscope of colour, where there is no longer ‘correct’
sources of information, simply interesting or illuminating ones? One answer . . . is the use of play. “[14]

Playgrounds Are Bounded

Most playgrounds have fences, and the fence in our metaphor provides focus by keeping out distractions. A playground might have a basketball court and a swing set, but not a baseball pitch nor a see-saw. The games inside the playground make use of the fence to focus the players on what is available in this particular playground. “The ‘play-world’ . . . has certain boundaries. Within it, the desires and appetites of the outside world are set aside and the play activities are participated in for their own sake.”[15] Having a boundary sets the playground outside of normal life and puts it into a liminal, safe space that invites play.

Playgrounds Are Equipped

In a playground, one can find playful things to do, be it flying on the swings or climbing a rock wall. Likewise, in our metaphorical playground, adult students need activities to engage their focus. For the purpose of the Framework’s playgrounds, play equipment provides content to manipulate, change, or examine. Playgrounds should be designed for their unique academic settings and learning goals. One playground may contain a progressive, cohesive set of equipment meant to be used in succession so that scaffolded lessons can be learned. Other playgrounds may have play equipment available as a smorgasbord for learning, no one activity depending upon another.

As an example, think about playground equipment that could promote students’ understanding of the frame Authority is Constructed and Contextual. Start with the Knowledge Practices (KPs),
because these provide ideas for learning activities that promote understanding of each Frame. The KPs are specific enough to spark ideas and general enough to apply broadly.

For the *Authority is Constructed and Contextual* Frame, one of the KPs states: “Define different types of authority, such as subject expertise, societal position, or special experiences.”[16] Playground equipment that could help a student learn this could include:

- An exercise in which students examine a fact-checking site to determine how authority is used in the site’s evaluations of others’ work. (Students could also evaluate the authority of the site’s authors.)
- Play “What’s the Authority?” in the manner of “What’s My Line?” Using items like peer-reviewed articles or law reviews, the librarian answers yes/no questions until the class can identify the kinds of authority authors would need for these kinds of documents.

The play equipment in each frame’s playground should be designed to actively engage the students in the concepts and practices outlined in the frame, and should be informed by effective pedagogical goals.[17]

The definitions of play and playground just discussed center around six attributes, as illustrated in Figure 1. To recap, play allows for experimentation and rehearsal, it is creative, and it makes the abstract concrete. Playgrounds provide safety from judgement, they have boundaries, and they contain equipment with which to play.
Fig. 1. Six Attributes of Play and Playgrounds

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Visualizing Playgrounds to Understand the Framework

Armed with definitions of play and playground, we can turn to the central idea of this chapter. Visualizing playing in a playground enables deep learning and gives teaching librarians an effective construct for creating active teaching plans. Analyzing how to structure a playground promotes a creative process that requires both concrete, detailed thinking and imaginative innovation. Imagining how to apply the metaphor to a specific frame is akin to playing in that frame’s playground. Playing in a playground transports one to a space outside of everyday judgments and constraints and allows for spontaneity and learning. This process works equally well for instructors and students, although they may play and learn differently in
order to satisfy different goals. To discuss in more detail how to use the playground metaphor, we will apply it to another frame.

**How to Use the Playground Metaphor with the Framework**

Fully appreciating the structure and meaning of the Framework is not easy. It is an intricate work that makes use of multifaceted ideas like threshold concepts, frames, knowledge practices, and dispositions. The Framework demands time and effort to understand and rehearsal to teach it successfully. Play as a learning method makes the Framework more accessible and facilitates an engaged and lasting way to comprehend it.

This chapter’s template for learning the Framework is the metaphor of playing in a playground. It provides a conceptual structure, like a skeleton upon which to flesh out detailed exemplars. For instance, how could a teaching librarian better understand the *Research as Inquiry* frame? One answer involves visualizing what a playground for this frame would contain and what playful activities would promote learning the frame’s content.

To apply the playground metaphor to *Research as Inquiry* look first at the frame’s threshold concept, which reads: “Research is iterative and depends upon asking increasingly complex or new questions whose answers in turn develop additional questions or lines of inquiry in any field.”[18] This is the topic of the playground. The playground fence keeps the focus on this concept. Next, the playground must be safe for playing and must contain play equipment related to *Research as Inquiry*. The above section on Defining Play described how a safe playground is a space set apart from judgements and real-world distractions. The play space provides equipment for experiment and rehearsal, but not for punitive evaluation. The equipment for playing must therefore avoid judgmental activities. See Figure 2.
Within the playground, what does it mean to play? This chapter’s definitions of play can act as a guide: playing calls for experimentation and rehearsal, it is creative, and it makes the abstract concrete. Further guidance for this particular playground comes from the Knowledge Practices of the *Research as Inquiry* frame, any of which could be the basis of a playful activity:

- formulate questions for research based on information gaps or on reexamination of existing, possibly conflicting, information;
- determine an appropriate scope of investigation;
- deal with complex research by breaking complex questions into simple ones, limiting the scope of investigations;
- use various research methods, based on need, circumstance, and type of inquiry;
- monitor gathered information and assess for gaps or weaknesses;
- organize information in meaningful ways;
- synthesize ideas gathered from multiple sources;
• draw reasonable conclusions based on the analysis and interpretation of information.[19]

Playing in this frame could be social or individual; could emphasize physical, social, or cognitive spontaneity[20]; could be engaging due to the experience it offers; and could act as the arena in which theory meets practice. These are general ideas about applying the metaphor to the Framework. Next, we turn to a close-up examination focused on a single frame and some specific examples.

Creating a Librarians’ Playground for Searching as Strategic Exploration

Librarians can increase their understanding of the Framework by playing with it. To address librarian learning, this section will walk through developing a playground for the Searching as Strategic Exploration frame.

The frame’s threshold concept is: “Searching for information is often nonlinear and iterative, requiring the evaluation of a range of information sources and the mental flexibility to pursue alternate avenues as new understanding develops.”[21] The accompanying Knowledge Practices are:

• determine the initial scope of the task required to meet their information needs;
• identify interested parties, such as scholars, organizations, governments, and industries, who might produce information about a topic and then determine how to access that information;
• utilize divergent (e.g., brainstorming) and convergent (e.g., selecting the best source) thinking when searching;
• match information needs and search strategies to appropriate search tools;
• design and refine needs and search strategies as necessary, based on search results;
• understand how information systems (i.e., collections of recorded information) are organized in order to access relevant information;
- use different types of searching language (e.g., controlled vocabulary, keywords, natural language) appropriately;
- manage searching processes and results effectively.[22]

A good place to start constructing the playground for *Searching as Strategic Exploration* is the boundary fence. What will be inside and what will be excluded? On the most general level the fence puts searching, strategy, and exploration in focus, leaving other aspects of information literacy outside the playground. See the illustration in Figure 3.

![Fig. 3 Creating a Boundary for the Searching as Strategic Exploration Playground](image)

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Next comes equipping the playground. The structure will need to enable interactions with the threshold concept and the Knowledge Practices, all from a teaching viewpoint. See Figure 4 for a visual presentation of the *Searching as Strategic Exploration* playground.
When thinking of what to include in a playground, consider adding several learning activities so that players have a choice of how to play. Here we will explore two possible activities. First, librarians can increase their familiarity of the frame’s threshold concept by playing Build-A-Paraphrase. It provides the opportunity to experiment with paraphrasing all or part of the threshold concept. For example, “searching for information is often nonlinear and iterative”[23] could be paraphrased as “searching can progress in spirals as you try different search terms in different search tools.” As the librarian plays with finding different ways to restate the threshold concept, she/he learns it thoroughly. In addition, playing through this activity builds a toolbox of phrases to use when teaching.
The second example piece of play equipment focuses on the frame’s Knowledge Practices. Take, for example, the fourth KP: “match information needs and search strategies to appropriate search tools.”[24] This piece of equipment helps librarians to experiment with creating learning activities for students.

**Exploring Database Search Strategies**

Select two or three databases that share a specific strategy and then use them to create an interactive game focusing on the chosen strategy. For example, both EBSCO’s Academic Search Complete and the ProQuest Platform give access to their thesauri and enable users to construct searches from within the thesauri. Students can use one common search question to explore each database’s thesaurus. With one set of students assigned to each database, each group can share their results with the class, and then the whole class can decide if using the thesaurus of either database made for an effective strategy. A librarian developing this activity could carry out test searches of both databases’ thesauri. For the research question “Is propaganda effecting US presidential elections?” the librarian could use “propaganda” and “presidential elections” as search terms. Both ProQuest and Academic Search used these words as their controlled vocabulary terms. In ProQuest, a search of both terms combined with AND resulted in thirty-six relevant articles. In Academic Search, the same search produced only eight relevant articles of nineteen total, and most of the articles were older than those found in ProQuest. These results contain several potential discussion points that could help the class to evaluate this search strategy.

**Rehearsal Studio**

Using play to rehearse teaching requires the instructor to be spontaneous and to allow for unpredictable student actions, all of which can cause instructors to feel anxious. Thorsted et al. described how students teaching a workshop based on play felt anxious about facilitating play. Their instructor explains, “Intuition requires that we dare to put
ourselves at stake, let ourselves be absorbed by the moment . . . They had to develop new ideas for the workshop. At this point, they could not rely entirely on what they already knew; instead they had to 'reflect-in-action' or let 'what-is-to-come’ emerge.^[25]

Having a rehearsal space in the librarians’ playground lets librarians practice and fail in a low-stakes environment, thereby increasing mastery and decreasing anxiety. The Rehearsal Studio game uses voice and/or video apps to record practice teaching sessions. Librarians can evaluate their own teaching and can continue using the Studio apps until happy with their teaching methods.

Once the playground is designed and equipped, librarians could use the Search as Strategic Exploration playground in several ways. First, the process of creating the playground can increase librarians’ understanding of the frame. Second, the librarian who created the playground could play with its learning activities to deepen her/his mastery of the frame. Finally, the playground could be the focus of a professional development workshop in order to give other librarians the chance to play in the playground.

The number of activities one could create for any playground depends on the parameters of the threshold concept, in the limits of imagination, the requirements for a safe playground, and the unique characteristics of the setting and the audience.

Students and the Playground Metaphor

Now that the librarians have had their turn playing with the Framework, it is time to think about how students will use the playground. Alison J. Head, director of Project Information Literacy, regularly publishes research that describes how college students and other adults approach information tasks. The reports^[26] make it clear that students
understand too little about how to properly evaluate information and information providers. Any way that teaching librarians can engage people in learning about information will help them to use information more effectively. Play-based learning gives students a hands-on, engrossing way to learn the concepts of information literacy.

The remainder of this chapter will provide more details about developing teaching plans using the playground metaphor. To start, gather information about the teaching situation for which you want to develop a playground. Key details include the class instructor's learning outcomes and parameters, including the amount of time available to the librarian.

Next, identify a frame that fits the teaching situation. Use the threshold concept to mark the playground’s boundary and delineate what topics will be in the playground and which will be outside. Then make a list of your learning outcomes for this teaching session, taking the instructor’s goals and parameters into account. Likewise list the KPs and any other learning techniques you will use. Your task at this point is to find the learning activities that will enable students to meet your learning goals. Essentially, you can play a matching game with your goals and the learning activities. The end result of matching goals and activities will be a list of play equipment you can put in the playground (For works that contain suggested learning activities, see the Appendix).

To create specific playground learning activities, think about how your students might approach and perform the given tasks. You may need to write instructions or make game pieces. You may need to scout out useful articles, journals, websites, or databases to use as part of the play. Check to see if the activities are playful. For instance, do they allow for experimentation or rehearsal? Are they creative? Do they make the abstract concrete? Then, check your proposed playground. Is it sufficiently safe and bounded? Figure 5 not only illustrates this process, but it also could be used as a game board for librarians’ learning.
PLAY through CREATING a PLAYGROUND

START HERE
Gather Situation Info
Identify Frame to Use

Frame Threshold Concept

MATCH GAME
Determine Boundary Fence
What's In? What's Out?

Learning Goal
Knowledge Practices & Other Learning
Techniques

Learning Goal
Learning Goal
Learning Goal

FILTER ONE
Pathway to developing playful activities that could enable learning

FILTER TWO
Experiment/rehearse
Creative
Makes Concrete

FILTER THREE
Safe Bounded

Create Instructions
Create Tangible Product Requirements

Create Details of Activity
continue

TEACH the Framework!
Fig. 5 A Pathway for Creating Teaching Plans Using the Playground Metaphor

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**Student-Created Play Documentation**

If having a record of students’ interactions with the playground is important for assessment, develop an end product for your students to create. One main goal should be for the students themselves to track information about their play. The librarian may not be able to observe and record students’ progress while also teaching. To illustrate how students could track their play, see the end product below.

**Activity:** Peer’s Review

**2 Players**

**Context:** Disciplinary journals use the reviews of scholars to decide if an article will be published in the journal. When the scholars complete their reviews, the editor weighs the reviewers’ judgements and decides to publish the article or not.

**How to Play:**

One player takes the editor’s role, and the other player takes the reviewer’s role. Draw a packet from the pile. It has two copies of one article and one gameboard. Both players read the article, discuss whether to publish, and then fill in their parts of the gameboard.
Peer’s Review Game Board

Reviewer’s Name:

☐ For ☐ Against Publishing

Reason #1:

Reason #2:

Reason #3:

Editor’s Name

☐ For ☐ Against Publishing

Reason #1:

Reason #2:

Reason #3:
Final Decision

Publish  ☐ Yes
☐ No

Reason: ________________________________________________________________

This chapter asked you to go on an adventure in order to learn to use the
Framework for Information Literacy for Higher Education. Using a metaphor of playing in
a playground, librarians and students go on a deep dive into the Framework’s threshold
concepts and Knowledge Practices. Incorporating play’s characteristics and the qualities
of playgrounds, we visualized building and using Framework-specific learning
playgrounds. Finally, we examined some ways to create teaching plans using the same
method of visualizing playing in a playground.

Notes

http://www.ala.org/acrl/standards/ilframework


[17] In regard to basing activities on learning goals, see Walsh, 2015.


**Appendix**

**Selected Sources for Playful Teaching Activities**

The following works contain useful, engaging ideas for active learning.


Loo, Jeffery L., David Eifler, Elliott Smith, Liladhar Pendse, Jianye He, Michael Sholinbeck, Gisele Tanasse, Jennifer K. Nelson, and Elizabeth A. Dupuis. "Flipped Instruction for


**Biographies**

**Shelley Harper, MSIS, MSW**

Shelley is the founder of Sharper Information Services which provides consultation and training to researchers and information users. From 2014 to 2019, she was the head of Instruction at Tutt Library, Colorado College. She has served as Instruction Librarian at Pikes Peak Community College and as Reference Librarian at Round Rock Public Library. She is a dedicated advocate for teaching concepts rather than relying on skills demonstrations. She presented “Teach Them Why” at the peer-reviewed 2018 LILAC Conference in Liverpool, UK. She is a past-president of the Colorado Academic Libraries Association. She lives in Colorado Springs with her husband and two insane cats. Reach her at shelley@finderhelp.info.

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CHAPTER 13

Discovering the Frames in One-Shot Sessions: Implications for Instruction

Jannette Finch, Jolanda Van Arnhem, and Mary Jo Fairchild

Introduction

The authors of this study are professional librarians who provide instruction in support of the mission of the College of Charleston, a mid-sized public liberal arts and sciences university, serving about 11,000 graduate and undergraduate students. Research and instruction services are provided by twelve librarians across the main campus, the Avery Research Center, and two branch campuses. The authors teach in different subject areas: one author is a branch librarian serving undergraduates and graduate students primarily studying in Professional Studies and General Studies, one is a digital scholarship librarian, and the third is a manager of archival instruction and research. Since the authors teach in different areas, they were curious about which of the six frames described in the Framework for Information Literacy for Higher Education (Framework) were most emphasized in their different instructional areas. They wanted to
gain a deeper understanding of the frames and their relationship with established student learning outcomes (SLOs) in order to better explain the Framework’s potential for information literacy learning with colleagues, faculty, students, and administrators.

The authors are members of the Library Instruction Advisory Committee (LIAC), the team which adopted SLOs to guide their information literacy instruction in 2015. The SLOs were based on student learning outcomes developed by Mahrya Carncross in "Redeveloping a Course with the Framework for Information Literacy for Higher Education: From Skills to Process." They were modified to fit the LIAC committee’s institution with Carncross’s permission. After the Framework was adopted by the Association of Research Colleges and Universities (ACRL) in 2016, the LIAC Committee with careful deliberation matched the SLOs with the Framework’s six frames and aligned with sample activities for assessment.

Members of the LIAC team attempted several visualizations in efforts to understand the frames and to integrate the Framework in their instruction. It was challenging to communicate the significance of the Framework with colleagues, faculty, and students. Figure 1 illustrates the frames that are
targeted through sample assignments when organized under the pillars of information literacy used in the open online textbook, the *Information Literacy User’s Guide*. In a semester-long credit bearing class divided into modules, units, or weeks, the pillars serve as a useful organizational structure.

![Diagram of information literacy}

Figure 1: Jannette Finch and Jolanda-Pieta van Arnhem, *Scaffolded Instruction Using the Framework, Units of Study, Student Learning Outcomes, and Sample Assignments*, 2016, Lucidchart. Based on
original design by Elaine Montambeau, Retention Rates Model, 2000, modified with permission.

Perhaps because the six frames of the Framework are not hierarchical and emphasize the dynamic and flexible nature of an individual’s intellectual journey in information literacy, they don’t lend themselves to a progression of advance through scaffolded assignments toward mastery of information literacy. Instead, the frames represent information literacy as “integrated abilities encompassing the reflective discovery of information” in “an arc of learning.”

In 30 minute to one-hour information literacy sessions (often called one-shot sessions), attempting to reach all frames might be impossible. Especially in the compressed time frame of the typical teaching session, effective visualizations are necessary to illustrate both the Framework and the metaliterate learner and to help communicate overarching information literacy themes. If librarians are fortunate to work with discipline-specific faculty to plan the information literacy session, the visualization seen in Figure 2 might help explain the Framework. One author of this chapter created the visualization to illustrate the Framework as the guiding overarching concept enveloping a university team approach of
instructional librarian, discipline-specific faculty, and technology expert to design activities or class experiences for student learning.

Additional examples of visual aids created by two of the authors to place the Framework in a visual context for information literacy instruction may be found in the six volume work for the ACRL series Publications in

Since its adoption, communicating the meaning and implications of the Framework has been a challenge. The *Framework for Information Literacy for Higher Education* presents threshold information literacy concepts which are intentionally non-prescriptive and open-ended. Each institution is invited to discover their own “best fit … including designing learning outcomes.”6 As noted by Gross, Latham, and Julien in their study of academic librarians’ attitudes toward the Framework, implementing the Framework presents “significant challenges.”7 Moving from the skills-based pedagogy described by the Standards, formally rescinded in 2016, to the highly conceptual and possibly “inaccessible” or even “elitist,”8 Framework has not been easy and has been well-documented in the literature.

In view of the complexity of the Framework, effective visualizations have been needed to communicate the fluid nature of the frames and to include the presence of the metaliterate learner. As described by Thomas Mackey and Trudi Jacobson in their 2011 article, “Reframing Information Literacy as Metaliteracy,” metaliteracy encompasses media, digital, visual and
cyber literacies and recognizes the role of the learner as a producer and sharer of new knowledge.9

By analyzing student surveys, and coding the results thematically, the authors were able to create visualizations that illustrate the frames in action. Looking at the frames emphasized in different instructional areas gave the instructors deeper insight into the “complex set of core ideas”10 that describe the Framework and reinforced the alignment of SLOs with the frames. As stated by Debra Sloane in her 2009 article, “Visualizing Qualitative Information,” the merging of qualitative information with graphical displays has “the potential to provide visual renditions of data that are both powerful and analytically effective.”11 In this chapter, the authors share their methods for gathering data and generating visualizations that allowed for deeper analysis of the Framework and instruction. Improved insight supports discussion of the Framework and student learning outcomes with colleagues, faculty, administrators, and students.

**Methodology: Coding Student Surveys**

To reach the goal of visualizing the frames and the metaliterate learner, the authors gathered student feedback from open-ended surveys distributed
after students completed 30 minute to one-hour one-shot sessions. The sessions were given at the request of faculty members.

The students gave anonymous feedback in one of two forms: 1) an open-ended two-minute paper, or 2) a simple survey [Appendix A]. Both surveys asked students to summarize the most important points of the instructional session. The branch library collected over 200 undergraduate student surveys and over 80 surveys for graduate instruction. Archival Research collected over 400 student surveys from both undergraduate and graduate students. Digital Scholarship gathered over 300 surveys from undergraduate and graduate students. The research protocol was reviewed by College of Charleston’s Institutional Review Board (IRB) and approved as exempt [Appendix B].

Students at the branch campus library sessions were both graduate and undergraduate, and were mostly adult learners, balancing class with full time work. Students in digital scholarship sessions were both graduate and undergraduate, mostly traditional-aged, taking classes on the main campus. Students participating in archival literacy one-shot sessions were primarily undergraduates engaged in humanities-oriented coursework (History,
At the branch library, student learning outcomes were not identified in advance, although the sessions were developed toward specific assignments with faculty input. The librarian began each session with a pedagogical technique known by the acronym K-W-L. Using K-W-L, the librarian asked students what they already KNEW about research, WHAT they wanted to know, or what was mystifying to them, and then after the session, asking what stood out to students from the session as new information they LEARNED. Using the K-W-L method starts a dialogue with students. Although a one shot session is tight for time, the value gained from exchanging information in a casual, low-stakes atmosphere is worth it. K-W-L exposes learner’s misunderstandings and prior knowledge. A discussion opens the door to examine how research may have changed for the adult students taking classes at the branch campus, or expands on learner’s base knowledge. The technique validates learners’ experience and acknowledges that they DO have prior understanding, which is validating to students who may start off feeling intimidated and defensive. The L part of K-W-L, reflecting what students learned that was most valuable to them, was captured in the branch campus student surveys.
Archival sessions identified two student learning outcomes in advance of their instructional sessions:

- Critically evaluate information according to discipline specific parameters of authority (Apply evaluative criteria in order to identify if source material is a primary, secondary, or tertiary information).
- Identify contextually appropriate tools and sources to answer research questions (Search archival holdings in the online catalog and finding aids in order to retrieve holdings information necessary for completing call slips).

An in-class exercise required students to employ observation, critical thinking, and inquiry to answer a series of questions regarding a contemporary cultural artifact. Once each small group completed the analysis, members presented their findings to their peers. Paper-based surveys were distributed at the end of class or were given to the faculty member to distribute during the next class meeting. Of these two methods, the archival instruction librarian noted that students offered more thoughtful responses when completing the surveys during the subsequent class period.
Student survey results were keyed into separate spreadsheets for each instructional area. To avoid inadvertent changes to the meaning, the authors recorded comments verbatim, including partial phrases and misspellings. The authors decided based on the relatively small scale of the project, small sample size, lack of funds, and the time frame for the project, to manually code the data. In qualitative research, manual coding is a legitimate choice, supported by the qualitative research community.13

Analyzing qualitative data presents a challenge in that coding is not an exact science. Qualitative research expert Johnny Saldaña, author of *The Coding Manual for Qualitative Researchers* (2009, 2016) affirms that coding is a judgment call, and methodological issues, researcher discipline and perspective, unconscious and recognized filters, language, models and theories all influence the coding process. Although subjectivity is unavoidable, coding is analysis.14 Stuckey affirms coding as analysis, although some research experts believe that coding is merely technical, preparatory work for higher level thinking about the study.15 Knowing the final goal was to gain deeper understanding of the Framework and link frames to SLOs, the authors kept the frame descriptions and student learning outcomes close at hand. The authors generated word clouds for
their areas in a preliminary attempt to look for interesting themes or patterns, as seen in Figure 3.

![Figure 3: Word Clouds generated from coded student survey results in four instructional areas (Voyant).](image)

Examining the data as a working group allows multiple minds to bring fresh approaches to analyzing and interpreting the data. “A research team
builds codes and coding builds a team through the creation of shared interpretation and understanding of the phenomenon being studied.”16 Saldaña suggests that team members code both their own and others’ data to cast a wider analytic net and provide a “reality check” for each other. Saldaña states that “intercoder agreement or interpretive convergence – the percentage at which different coders agree and remain consistent with their assignment of particular codes to particular data – is an important part of the process.”17

After initial coding (called “lumper” coding by Saldaña),18 the three authors linked themes with each frame. A code in qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data.19

As affirmed by Stuckey, coders continually ask “What does this mean?” or “What does this exemplify?”20 For example, even though Google Scholar is a versatile application or tool, the authors agreed that in the context of their individual instructional environments, the phrase Google Scholar aligned with both Authority is Constructed and Contextual and Information Has Value.
Words or short phrases from student surveys were coded by each instructor to align with the frame that, in their opinion, most closely matched. The authors allowed for as many as three codes to be assigned for each theme, affirming their belief that the frames are fluid and more than one frame may apply to a single theme. For example, when a specific database was mentioned, the authors chose to code this as primarily Searching as Strategic Exploration and secondarily as Research as Inquiry. In another example, when students cast a wide net, then focused their research by building on bibliographies, the authors coded that as primarily aligning to Research as Inquiry, then secondarily to Searching as Strategic Exploration. When students discussed citations and citation formats, the authors agreed that this most closely aligned with Scholarship as Conversation, Research as Inquiry, and Information Has Value. When student feedback centered on features of the tools, such as adding multiple databases to the search, or using the thesaurus to build a search, Searching as Strategic Exploration was matched.

The authors revisited the coding process multiple times in what Saldaña calls “splitter coding,” which is splitting the data into smaller elements, or subcoding. The authors noted that their results varied from day to day; in order to make the coding more consistent over time and instructional area,
they devised a coding rubric. The rubric controlled shifting interpretations of the Frames, and allowed for more consistent coding in aligning Frames and instructional themes.

The whole numbers derived from the coding were placed into Microsoft Excel and pie charts were created. From the pie charts, percentages were obtained to make scaled circles for the final visualizations.

**Design Considerations for Visualizations**

Developing an information visualization model requires translating raw data into a data table, which readies it for eventual mapping to the visual. As noted by Miles and Huberman, extended text can overload the brain’s information-processing capabilities. Text is sequential, poorly structured and bulky. Spreadsheets can easily generate data in table format, but as Sloane states, even though they are the best display tools for qualitative data results, tables cannot graphically show patterns within the data.

Selecting the right type of visualization is determined by several factors including the size of the dataset and what type of analysis is needed. The
type of visualization employed reveals information within data. In choosing visualizations, different types are required depending on whether to reveal co-occurrences, relationships, or the evolution of topics.25

In selecting possible visualizations for the Framework, the authors feel it is important to avoid shapes that suggest grouping according to hierarchy, since no one frame takes precedence over another. For example, a rigid system such as an organizational chart might be inappropriate to display the relationship of the frames to each other and to other data, since the spatial organization of that graphic suggests hierarchy and power. Abstract depictions might be more appropriate, since according to Isabel Meirelles, these visualizations don’t suggest a grouping, but instead rely on encoding to understand the visualization. 26

The authors were drawn to shapes such as grids and graticules, ebbs and flows, maps and blueprints, and nodes and links to explain the Framework.27 In these categories, common visualization types include charts, tables, graphs, geospatial maps, and network graphs.28 Within these types, the use of color, shape, line, hierarchy, and composition suggests relationships and reveals patterns, illuminating themes and information lost within text or spreadsheet.
Guided by Katy Börner’s *Atlas of Knowledge: Anyone Can Map* (2015) the authors selected the types of analysis appropriate for studying the data. Nominal data (produced by student feedback) changed to ordinal data (when the authors coded the responses to align with the Frames) suggests two types of analysis: topical analysis (asking What) and network analysis (asking With Whom).29

The visualization models suggested by Börner for working with topical data (asking What) include lists, tag clouds, graphs, circular graphs, crossmaps, isoline maps, or self-organizing maps.30 These visuals can show relationship of elements to each other.

Network visualizations (useful for asking With Whom) use nodes and edges. Edges may be given weight and labels to suggest direction, to clarify, or to suggest paths. Examples are tree graphs including dendrograms, radial tree, link tree, balloon tree, enclosure trees, and mosaics. Network graphs include clustering, arc graph, circular graph, hive graph, node-link graph, Sankey graph, bimodal graphs, and network overlays.31

In addition to Börner’s work, the authors found Manuel Lima’s *The Book of Circles: Visualizing Spheres of Knowledge* (2017) an important aid in
choosing visualizations. Lima gathers visual symbols in black and white diagrams, grouped into taxonomies which he calls “building blocks” of a “new visual language.”32 In The Book of Circles, Lima calls the circle, originating in nature, as becoming a “chief guiding principle of human culture.”33 Organic circle shapes suggest fluid movement and are aesthetically pleasing.

Visualizing the Frames and SLOs in One Shot Sessions

As seen in this chapter, the authors experimented with many graph shapes in their desire to understand and explain the Framework. Simple pie charts, bar charts, and word clouds offered some insights. However, they did not illustrate connection with the metaliterate student and the relationship of different areas of instruction that were possible with more complex visualizations.

Card et al., in Readings in Information Visualizations: Using Vision to Think (1999) attribute Edward Tufte as stating, "There are right ways and wrong ways to show data; there are displays that reveal the truth and displays that do not."34 The authors wanted to move beyond the bar chart, pie chart or word cloud and create visualizations that capture truth in instructional emphasis and relationship.
Two visualizations succeed in showing the frames emphasized in each instructional area in fluid circle shapes. Both visualizations show four areas of instruction and acknowledge the presence of the metaliterate learner. The circular tie visualization in Figure 4 uses iconic circle shapes to suggest motion and fluidity. Placing the circles in a network node layout suggests relationships, as the different instructional areas are separate, yet connected. All instructional areas refer to the central metaliterate learner, reminding us that information literacy efforts are in support of metaliterate students.
Figure 4: Jannette Finch, Circular Tie Visualization (Lucidchart), 2018. Central is the metaliterate learner. Nodes branching from the center indicate instructor area, with scaling circles indicating frame most emphasized in instruction.

The enclosure tree seen in Figure 5 is an organic form of the treemap. A treemap is often used to show both hierarchy and relationship, but using
the circular form removes any suggestion of hierarchy, since all instructional areas are equal and frames are not hierarchical. In this visualization, the metaliterate learner is again central to instructional efforts, but is shown encompassing all efforts. The four areas of instruction are equal in size to each other and are relationally close. The frames emphasized in instruction are shown top to bottom, alphabetically, but are not rigid. They flow peacefully within their instructional context, fluid enough to change as instructional efforts shift either deliberately or organically.
Figure 5: Jannette Finch, Enclosure Tree Visualization (Lucidchart), 2018. The metaliterate learner encircles the instructional process.
Within are the four areas of instruction, with the scaling circles representing emphasis of the frames.

Discussion

So what is learned by working to decode student surveys and align responses to the Framework? What is the point beyond producing aesthetically pleasing visualizations and learning a lot about shapes? Looking at the visuals allows each instructor to see, understand, and explore patterns. The patterns revealed informs the branch librarian that if she wants to improve her understanding and use of the frame Information Creation as a Process, she will talk to her digital scholarship colleague. If she wants to learn how her colleague in archival research uses the frame Authority is Constructed and Contextual to instruct students about primary resources, she will ask her.

Both visualizations identify frames emphasized in the different areas of instruction, as coded from student responses. In using circular structures, the authors suggest relationships among frames, instructional areas, and learners, instead of hierarchy. In depicting instruction visually, the authors have discovered that they are using pedagogical approaches that reflect the
frames, rather than teaching to a particular frame or set of frames. The frames bubble up organically as instructional themes.

As stated by Zoss, Gestalt principles explain that visual elements contained within an enclosing shape will be seen as more similar to each other than to elements outside that shape.35 Another Gestalt principle known as proximity reveals grouping as elements are spaced closer together. To suggest less grouping, elements are spaced further apart. Seeing the frames grouped in proximity to each other and thematically as areas of instruction offer analysis that may “uncover latent patterns.” 36 By viewing the frames as data visualized graphically, patterns emerge. Data collected from digital scholarship instruction indicate that undergraduate and graduate students benefit from creating products during instruction, captured by Information Creation as a Process. Instruction in this area contributes to the development of students as metaliterate learners by providing them with the opportunity to enhance their media, digital, and visual literacy skills. The instruction emphasizes the role of the learner as producer and sharer of new knowledge and demonstrates a significant shift in instruction as the teaching librarian acts as “coach, guide, and mentor.”37 Assessment data collected from these sessions highlight Information Creation as a Process and focus less on Information Has Value, Authority is Constructed
and Contextual, and Scholarship as a Conversation. The relative absence of Searching as Strategic Exploration and Research as Inquiry in this data set is of interest, and may be related to the stage the students have reached in the research process as they begin to create an intellectual product.

Data collected from archival instruction indicate that undergraduate and graduate students benefit from engaging with archival and special collections resources, especially if primary source materials were deployed during the session. Students in small groups represent a micro-community of scholars in which a variety of interpretations and insights regarding a primary source object shape a new dialogue among peers, so Scholarship as Conversation is the frame that appears the most. The individual student experiences an opportunity to become comfortable with posing new questions in the quest to achieve stronger research skills, illustrating learner knowledge practices and dispositions of Research as Inquiry.

The absence of Information Creation as a Process in both undergraduate and graduate instruction at the branch campus is notable. What does that suggest about the instructor or the students or both? The instructor notes the small representation of Scholarship as Conversation. Realizing the value of this frame as an overarching information literacy concept, she will
be more mindful in future instructional sessions of emphasizing Scholarship as Conversation as a theme. Although the frames emphasized are not a conscious pedagogical choice, seeing the patterns in which they appear may either affirm instructional directions or suggest adjustments.

The authors next wanted affirmation that their instructional efforts, reflected in the frame visualizations, also aligned with the six established SLOs. A simple table illustrates that all four areas of instruction reached all SLOs. The data from the table was copied into Excel and produced into a stacked bar chart, seen in Figure 6. The only instructional area that did not touch on all frames was Branch, Graduate, which did not code any results to the frame Information Creation as a Process. The SLOs were met in this instructional area by the presence of the other frames. The SLOs appear by the frame they are aligned to, so the SLO color that first appears next to the area of instruction and frame is the best match, in the opinion of the authors, followed by the second best, then third, and sometimes, a fourth match. Confusing? The horizontal bar chart seen in Figure 6 generates the information that we have met all SLOs but it may not best display the point. The reader has to have too much information in order to decode the chart.
Thinking about what kind of chart or graph gives the most information with the least amount of encoding is valuable mental exercise. Embracing the philosophy of the best designers who try to convey meaning without
visual noise or clutter is a worthy goal, only hampered by lack of technical expertise or time. Figure 7 is the same information shown in the bar chart, but it is cleaner. Each student learning outcome is shown as a line, the frames are bands, the areas of instruction are segments of a circle, and once again, we have placed the metaliterate learner as central to all efforts. In the visualization seen in Figure 7, it is easy to see what SLOs are met, and which are met most frequently.
Figure 7: Jannette Finch, Revisioned areas of instruction, frames, and SLOs (Lucidchart), 2020.
Conclusion

As Chen states, information visualization can help “to see patterns, make connections, and draw conclusions from the data.” 38 Börner, Maltese, et al. emphasize that devising structures and models add sense-making value and lead to knowledge discovery.39 As discovered, even preliminary visualizations using Excel can reveal patterns. The authors chose circular visualizations, but other library professionals may prefer linear visualizations, or graphics that illustrate changes over time. The type of visualization employed both affects interpretation of the data and is suggested by the data. As stated by Meirelles, visual displays of knowledge can act as a “cognitive artifact,” strengthening our mental abilities by recording information, conveying meaning, facilitating search and discovery, and providing models through manipulation of data.40

In designing visualizations, library professionals are empowered to define their data story. Effective visualizations can capture truth using any type of data: level of student (adult, traditional; undergraduate, graduate), session type (for credit class, one shot session), subject specialization of instructor (Sciences, Law, archives, research, digital scholarship), session time (in semester, in the day), or changes over time (class rank analysis).
Future visualizations may include an attempt to create a single visualization that captures and communicates the entire Framework. It may be interesting to look at multiple data sets from many university library programs, with frame themes depicted in a Sankey diagram. This type of visualization would appropriately show multiple thematic data streams from multiple sources spread over time.41 The authors worked in two dimensional visualizations for this article. What is possible in three dimensions or more? What about other visualizations, like trees, maps, rose charts, subway maps showing “trains of thought,”42 arcs, or structures that show time, like history flows, alluvial graphs, stream graphs, or arc graphs?43

*The Framework for Information Literacy for Higher Education* and other developments represent a sea change in information literacy instruction. 44 Changes in 21st-century information literacy are difficult to grasp and integrate when presented in separate texts. In devising ways to illustrate the Framework and the metaliterate learner and to understand implications for instruction, the authors achieved a deeper understanding. The eye informing the brain provides a faster path to comprehension than reading lines of text or seeking patterns among spreadsheet cells.45 As stated by Bederson and Shneiderman, “the eyes have it… there is simply more
bandwidth and processing power for input through the human eye than through any other sensory modality.”46

Notes


18. Ibid., 23.


26. Ibid., 20.


31. Ibid., 62—63.


33. Ibid.


41. Meirelles, 71.


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CHAPTER 14

New Visions of Student Worker Training

Amy Harris, Dr. Doris Van Kampen-Breit, Jacalyn Bryan, Michelle Joy, and Kathleen Kempa

Introduction

Student workers are the backbone of many academic libraries’ public service units. They are frequently the first employee a patron interacts with. They shelve the books, clean keyboards, brew coffee, and straighten periodicals, along with a multitude of other tasks, but are an often overlooked resource for providing enhanced services and support. Today’s academic libraries operate with lean staffing models and there can be significant periods of time when full-time employees may not be available, especially late in the evenings and on weekends. Studies show that students are more likely to ask for help from a peer than a professor or a librarian, indicating there is some untapped potential in the work-force.[1] Rather than continue to underutilize student workers, it was decided to leverage the student workers’ approachability and curiosity by demystifying that most mysterious of library skills; the Information Search Process (ISP).
At the Daniel A. Cannon Memorial Library, both undergraduate and graduate student workers are relied on heavily for staffing circulation, monitoring and troubleshooting printers, and other services. Student workers know how to answer the phone, check a book in or out, shelf read, and refer patrons to the library faculty, which at this institution includes faculty librarians and writing support faculty.

In 2016, the faculty librarians evaluated undergraduate student workers’ knowledge of how to search the catalog and request materials not in the library. Results indicated there was a distinct lack of awareness concerning basic and advanced search tools and the location of interlibrary loan (ILL) forms on the website. Therefore, they could not be expected to be able to assist a patron if library faculty were unavailable. In response, the student worker handbook was updated, and additional requirements were put in place for training student workers, but the focus was on customer service rather than information literacy (IL). It took the implementation of the ACRL frames[2] and increased student enrollment (which caused an increased demand for library services during night and weekend hours) to drive the faculty librarians into action. Lengthening service hours with the current staffing model was not a viable option; they did not have the capacity to spread out or lengthen faculty availability. However, leveraging the student workforce by providing IL training
was a feasible alternative. Therefore, library faculty adapted the ACRL frames, and updated how
they recorded statistics for one-shot IL instructions, and also recently pushed forward into the realm
of teaching the frames to library student workers using “learner-generated drawing” to improve
student recall of concepts taught.

Literature Review

Active learning has been employed by librarians in IL instruction to good effect.[3] Examples of
active learning strategies include, think-pair-share, jigsaw, visualizations such as drawing, scavenger
hunts, and photography.[4] While not discussed in this chapter, technology using collaborative tools
such as Socrative.com, Padlet, Blackboard Collaborate is also useful.[5] Benefits of using active
learning strategies include increased self-efficacy online and in the physical library, improving
perceptions of the library and librarians, and reducing anxiety.[6]

Visual representations can reduce cognitive load on the viewer and assist with identifying patterns
quickly. Furthermore, visualizations of data are no longer considered to be of lesser value than text-
based data. “The importance of images and visual media in contemporary culture is changing what it means to be literate in the 21st century. Today's society is highly visual, and visual imagery is no longer supplemental to other forms of information.”[7] Learner generated drawings are one specific form of active learning which appears to be an underutilized teaching technique for information literacy instruction. This technique can help students internalize the acquisition of knowledge.[8] The professional literature does not reveal many articles discussing the utilization of visualization in library instruction sessions. However, Brier and Lebbin found that “Drawing makes for more active and memorable learning experiences” and “…helps…demonstrate [students’] competence (or ignorance) of information literacy concepts.”[9] The researchers also found that drawing provided a means for students to explore their understanding of information literacy. It assisted librarians understanding of the extent to which the students comprehended the concepts being taught.[10]
A Little Background

In 2011, while still under the ACRL *Information Literacy Competency Standards for Higher Education*,[11] critical thinking was at the heart of Saint Leo University’s Quality Enhancement Program QEP. The QEP is:

“a document developed by the institution that (1) includes a process identifying key issues emerging from institutional assessment, (2) focuses on learning outcomes and/or the environment supporting student learning and accomplishing the mission of the institution, (3) demonstrates institutional capability for the initiation, implementation, and completion of the QEP, (4) includes broad-based involvement of institutional constituencies in the development and proposed implementation of the QEP, and (5) identifies goals and a plan to assess their achievement” (SACS-COC, 2019 [http://www.sacscoc.org/QEPSummaries.asp](http://www.sacscoc.org/QEPSummaries.asp)); it is a requirement under the SACS-COC *Principles of Accreditation*([http://www.sacscoc.org/QEPSummaries.asp](http://www.sacscoc.org/QEPSummaries.asp)).[12]

Named “A Model for a Challenging World: Using Critical Thinking and Values for Effective Decision Making,” the Saint Leo University QEP was denoted by a simple formula: critical thinking + core values = decision making.”[13]

The first step in this process involved mapping the ACRL *Information Literacy Competency Standards for Higher Education*[14] and their respective performance indicators and outcomes to the
components of the QEP rubric. This process mapped fifty-four of the eighty-six (63%) outcomes to the QEP rubric. This indicated a strong relationship between these two documents, especially for the critical thinking elements of Information, Concepts, and Conclusions and Interpretations.[15]

General statements describing how librarians can help students to achieve these IL skills were created for each of the mapped performance indicators and outcomes, along with specific examples.

By engaging in this project, faculty librarians were able to recognize how their teaching and reference work had a direct connection to the university’s QEP and especially the elements of critical thinking. Overall, mapping the ACRL IL Standards to the QEP (critical thinking + core values = decision making) served to demonstrate the library’s support of the Quality Enhancement Plan.[16]

**Redesign of Library Instruction for Students**

In the re-design of the library orientation for the SLU101, Introduction to the University Experience course, the new iteration focused on Standards One and Two.[17] “An information literate individual is able to:
1. Determine the extent of information needed

2. Access the needed information effectively and efficiently

The re-design also integrated the nine effective instructional strategies identified by the Midcontinent Research for Education and Learning (McREL) Institute. These strategies are described in Dean, Ceri, and Marzano’s *Classroom Instruction That Works: Research-Based Strategies for Increasing*
One of these instructional strategies used in the redesign involved the use of nonlinguistic representations (e.g., visual and kinesthetic renderings and modeling). Previous iterations of the library orientation included the CRAAP (Currency, Relevancy, Authority, Accuracy, Purpose) method for evaluating information developed by librarians at California State Fresno-Chico. The faculty librarians brainstormed about how to turn this method into a visual representation and came up with the idea of CAARPy (Figure 1), a fun and engaging “fish” to help students retain the mnemonic. The end result involved revising the anagram CRAAP to CAARP, taking some poetic license with the word “carp” and designing a cardboard stand-up fish named “CAARPy.” The design was created by one of the graphic designers at Saint Leo University. Additional non-lingual resources created for SLU 101 included a “catalog box” containing concrete examples of the different formats contained in the library catalog and a kinesthetic demonstration of the Boolean terms AND, OR, and NOT.

To determine if the new focus on nonlinguistic representations was effective, a study was then conducted for the SLU101 course by administering a pre- and post-test to twenty-seven sections. The library orientation for the control group did not include the nonlinguistic representations, while the
library orientation for the experimental group included the nonlinguistic representations described above. The data, which was analyzed by the Office of Institutional Effectiveness at Saint Leo using SPSS, indicated that the experimental group obtained a higher score on the post-test than the control group and that this was statistically significant. When examining the test questions related specifically to non-linguistic representations, the experimental group again obtained a statistically significant higher score on the post-test. “This finding indicates that the use of non-linguistic representations resulted in better learning of the concepts involved.”[21] CAARPy continues to be a part of the SLU 101 library orientation. This method of evaluating information corresponds to the ACRL frames[22] Authority is Constructed and Contextual and Research as Inquiry.
One of the next adaptations by Saint Leo faculty librarians to assess the application of IL standards in their teaching was to change their reporting form and take advantage of the visualizations generated. For example, a summary report to the Library Committee concerning library instruction used a series of word-clouds as part of the report. (Figure 2) The visualizations were helpful in engaging the intended audience, creating a dialogue with the Library Committee and library faculty, which then sparked further discussions in the library about the potential usefulness of visuals in instruction.
Redesign of Library Instruction for Student Workers

With growing enrollment and demands for extended hours and extended reference support, the current personnel level could not meet the demand. During the fall and spring semesters, library hours are 8 AM–2 AM. During finals week, the library is open twenty-four hours for four days.

During a typical week in the academic year, the Daniel A. Cannon Memorial Library is open 112 hours. Library faculty are available to students for fifty-seven hours each week; however, for thirty-seven hours a week, the library is run by student workers and one staff member. Therefore, it was logical to leverage the student workforce’s capabilities by providing IL training, and some customer service skills training.

Because these students often work when library faculty are not available, they are only superficially aware of what librarians do to support students research efforts. They may also be confused by the difference between library faculty and library staff.[23] Typical training at most academic libraries involves instructing students on how to perform tasks such as staffing the circulation desk, re-shelving materials, cleaning keyboards, straightening periodicals, and receiving print periodicals in the system; students are taught to be consistent in doing the assigned tasks,
paying attention to details in order to ensure the library holdings and circulation statistics are accurate and up-to-date. This has been referred to as “shallow participation” where “involvement in library work is superficial and minimal.”[24] It is unclear from the literature whether student worker training involves teaching students the theory or frameworks that go with those tasks. It seemed clear that teaching both the task and the theory behind it would help student workers perform more effective searches in the databases, execute searches at a higher level, and understand the concepts of IL and the information search process.

The training plan included recruiting our best student workers and Graduate Assistant (GA) workers – eight students in all. Training sessions were held for ninety minutes for a period of four weeks. The threshold concepts defined in the Framework for Information Literacy for Higher Education[25] were emphasized. As part of the planning process, the faculty librarians created a LibGuide with tabs for each ACRL IL frame containing the material for each lesson; links to relevant resources; a redirect link to the ACRL Information Literacy Frames webpage; a pre-test; and the wrap-up session with post-test.
Learning outcomes were provided at the beginning of each of the first three training sessions. Active learning exercises were incorporated to fully engage students in the training. Toward the end of each of the first three sessions, the students worked in pairs to demonstrate their understanding of one of the frames taught that evening by creating a hand-drawn illustration. The Library Director and the Undergraduate Online Services Librarian taught two frames, *Information Has Value*, and *Searching as Strategic Exploration*. The Reference & Instructional Services Librarian taught *Research as Inquiry* and *Authority is Constructed and Contextual*. The Instruction & Assessment Librarian taught *Information Creation as a Process*, and *Scholarship as Conversation*. The final meeting was a wrap up session with Q & A.

**Pre-test**

Each student was asked to complete a pre-test at the first training session to determine whether students had a basic grasp of the overarching concepts of the ACRL frames, and current knowledge of job responsibilities. Students were then asked what had been the most difficult question they had encountered in the last month; answers varied widely, but all were related to supporting the needs of the patron. Students were also asked who they would be most likely to ask for assistance from, when
faced with a question they could not answer. Unsurprisingly, students would ask a peer before asking for assistance from a supervisor. Students were then provided with a series of scenarios related to the ACRL frames and asked to respond to each of the scenarios. The scenarios were created specifically for the training sessions, and the purpose was to gauge students’ basic knowledge, rather than a more in-depth understanding. Overall, the student workers were able to identify as a first or second choice what they should do in most scenarios. The ACRL frames which students appeared to be less knowledgeable about were Research as Inquiry, and Authority is Constructed and Contextual, followed by Information Has Value and Information Creation as Process.

**Instruction Sessions**

*Session 1A: Information Has Value*
The first session on *Information Has Value* began with a discussion with the students on how to find information to meet various needs, such as costs for housing (campus vs. private); theater times; location of nearest coffee house; and price of a daily ticket on a local bus. By placing it in context, the students had a clearer understanding of the concept when we began to discuss the ACRL frame of *Information Has Value*. 
The librarians pointed out that sometimes websites want to charge for their information. Utilizing the library’s resources and IL skills could help student find the information needed without hitting a paywall. To make this connection with the concept more concrete, the librarians navigated to a paywall (the *New York Times*), and showed the students the paywall. They then assisted the students in locating the *New York Times* in a library database where the news stories were available without a paywall.
The faculty librarians then had the students break into groups to draw an image that discussed one of the topics covered. One group chose Information Has Value while the other two groups drew paywalls. Figure 4 which depicts the Saint Leo key to unlock the paywall was a clear indication the students had internalized the concept being taught.

Session 1B: Searching as Strategic Exploration
During the second half of the first session, students were given a choice of four scenarios that all involved locating information in order to make a good decision; the scenarios included a new family dog, a new computer, a better car, or the best shoes for your feet based on a purpose selected by the student. One group asked if they could work on research on Alzheimer’s and tau particles in the brain, which was agreed to; no one wanted to research new shoes. The groups were asked to take a few minutes and use either paper and writing implements or the white board in the classroom to determine the criteria for the topic, where they would look for the information, and what key words would be used. They were asked to share results with their research partner, and then with the entire group. One group chose the new dog for the family and Googled the information. The group that chose a new computer decided to use the IEEE database for their searching, and immediately hit a roadblock, so switched to EBSCO, and finally to Google. The group that was researching a better used car tried the library catalog, then decided to try Google. The group that wanted to look for information on tau particles and Alzheimer’s tried the library catalog, then searched in PubMed using a link from the library’s website. After fifteen minutes of this activity, we stopped and discussed the keywords used, resources attempted, paywalls they hit, results found, and whether they felt they had found useful information. A debriefing followed in which we discussed search strategies, including
Boolean search terms, and how to determine if they were successful in selecting the appropriate resources (sometimes by asking for help).

Figure 6 – Searching the Forest of Information

The students were then asked to stay in their groups, and to draw a picture of a topic from session 1B. The best example of this concept is Figure 6. They used an “explorer” inside of some woods, the explorer used a “map” of strategies to try, and then the computer to locate that one unique “tree” of information needed from the entire woods. The session concluded by re-emphasizing their
importance to the library, and the additional help they would be able to more confidently provide after they had completed all training sessions.

Session 2A: Research as Inquiry

Figure 7 – Happy Thesaurus Dinosaur

Session 2 was attended by seven undergraduate and graduate student workers. The first frame to be covered was Research as Inquiry. The faculty librarian and the students briefly discussed a definition
of research, which involves gathering data and analyzing information to answer a question. Then the
discussion continued to the frame of *Research as Inquiry* which was reviewed in the LibGuide.

Questions posed to the students included: Why do we do research? How do we formulate a research
question? How do we identify effective search terms? Knowing that the students had briefly
discussed developing research questions in the previous session, the faculty librarian reviewed this
material by asking them to examine a list of topic questions and to determine whether they
were too broad or too narrow. The students were then asked to revise the topics to demonstrate their
understanding of how to refine their question. Next, the session moved on to identifying appropriate
search terms once a research question has been established. The faculty librarian introduced the
concept of a “thesaurus” and asked for a definition. While the students appeared to know how to use
an online thesaurus in Google to locate synonyms, none of them were aware that a research database
may also contain a thesaurus of controlled vocabulary. The faculty librarian asked the students for
synonyms of the word “shyness” and wrote them on the board. She explained controlled vocabulary,
subject headings, and why using the predetermined terminology could lead to better search results.
The students then worked in pairs on an activity to discover how they could identify these subject
terms in the PsycINFO database. To bring this into context, the librarian had the students search for
the phrase “lack of sleep” in the PsycINFO database. Students identified the subject terms found below each of the first five article titles in the results list. They were able to identify “sleep deprivation” as a subject term for “lack of sleep.” A second search

Figure 8 – Screenshot of Keyword Search to Subject Headings

was performed using “sleep deprivation” and the students noted that the results increased. The students were then directed to look for Subject: Major Heading Terms in the Refine Results menu and to select a term to further narrow down their results (Figure 8). At this point, the students expressed their excitement about discovering new methods to improve and refine their search results and opined the fact that they were not aware of these tools.
Session 2B: Authority is Constructed and Contextual

The second half of the session focused on the frame Authority is Constructed and Contextual. Using the LibGuide as a resource, the faculty librarian asked the students how they could determine if a source is credible. The discussion led to the idea that examining the credentials of an author is one way to determine credibility; this includes “subject expertise, societal position, and/or special experience.” The faculty librarian then asked the students for examples of authority. The discussion then moved on to determining authority in various resources, beginning with scholarly/peer-reviewed journals. There was a discussion of the peer review process and all of the students seemed to be familiar with how to search for peer-reviewed articles in a database. Then the students were asked to consider authority with regard to various non-scholarly resources such as magazines, newspapers, websites, and blogs.
Figure 9 – Tree of Knowledge
Figure 10 – Peer Review Process

The activity for authority required the students to each read a different online article regarding deforestation and ascertain the authority of the information. One article was published in The Guardian, the second article was a peer-reviewed article in ProQuest, and the third article was published by livescience.com. The students’ findings were listed in separate columns on the whiteboard. After discussing the authority of each of the articles, the students ranked them according to degree of authority. To conclude the session, the students were asked to create a drawing in their
groups which would represent one of four ideas: Research as Inquiry, Thesaurus/Subject Terms, Authority and Information, or Peer Review. The results can be seen in Figures 7, 9, and 10. Figure 7 relates to the frame of Research as Inquiry and illustrates the concept of “thesaurus” as depicted by a happy dinosaur surrounded by synonyms for “happy.” Figures 9 and 10 correspond to the frame of Authority is Constructed and Contextual. Figure 9 shows authority as a person with a Ph.D. next to the Tree of Knowledge, surrounded by those who are less authoritative. Figures 10 depicts the peer review process with various individuals reviewing an article and providing feedback to the author.

*Session 3A - Information Creation as a Process*

All graduate and undergraduate student workers attended the third session which covered *Information Creation as a Process* and *Scholarship as Conversation*. During the first half of this session, the discussion focused on how information is created both inside and outside the academic setting.
Figure 11 - Current Event Creation Process
Figure 12 - Changing Genres

Students shared that they generally find out about current events using social media. They then discussed how information about an event may be conveyed over time and how the format of the information changes depending on the audience, the purpose, and the time period. For academic assignments, the focus is usually on “scholarly” resources, such as newspapers, journal articles, and books. However, when looking at current events, it is evident that the old model of information creation has shifted and broadened to include other formats. A first-hand observer might take video
or pictures on their phone and share it with others on social media. It can then go viral and be picked up by the news media.

In the same way, historical events may have first been disseminated in newspapers and television before being presented in book form or adapted to film. Students discussed what they thought in general when reading about a historical event. This was a lively discussion as students discussed the pros and cons of the genres and their own personal preferences.

Figure 13 – Scholarly Dialogue
Students then had a chance to try to follow and track these changes in the way information is created and disseminated using an assignment originally developed by Bucknell University.[26] For this hands-on section students could choose a controversial current event or a historical event. Once they had chosen an event, they then looked for information on that event in different formats and noted the date that each item was created. When they compared the results, students were able to see how information dissemination has changed over time. While an historical event would have originally run in newspapers first (and probably word of mouth), a current event starts in online news and social media.

Session 3B - Scholarship as Conversation
Figure 14 – Example of Citation Mapping

For the second part of this training session, the topic shifted from *Information Creation as a Process* to *Scholarship as Conversation*. The hands-on portion of this was adapted from an assignment by Desirae Zingarelli-Sweet.[27] Students used Google Scholar to search for “Bloom’s taxonomy of educational objectives.” After selecting a scholarly journal article from the list, the students then noted sources that cited this original source and listed them. They also looked at the references from the original source and listed some of them. By looking at the number of times a source had been
cited by others and drawing arrows to connect sources, they could visually see the scholarly conversation that had taken place.

Students then picked an idea from the entire training session and created an illustration for it. Figure 11 was especially detailed as the students demonstrated their understanding of how a current event would eventually be in scholarly journal articles in EBSCO and Gale databases.

Wrap up – Post Test

For the final session, we had the students take the post-test first. Overall, the student workers were able to identify as a first or second choice what they should do in most scenarios. They were more comfortable with the information search process, strengthening their understanding of what types of resources to use when conducting an information search. They also demonstrated a small increase in their understanding of the “peer review” process, indicating at least a baseline knowledge of how Authority is Constructed and Contextual. All of the students were also able to correctly identify Scholarship as Conversation; however, they continued to struggle with the idea of information as a commodity, which has its own value.
What We Learned

The student workers were excited and engaged at each session. They appreciated the additional training and were proud to have been chosen to participate as they felt it demonstrated their value to the library’s operations. They now clearly see themselves as “real” employees, instead of a placeholder at the circulation desk. The student workers also have a deeper understanding and appreciation of the ACRL frames, IL, and their role in assisting library users.

Interestingly, the faculty librarians are now seen as more approachable by the student workers. This is evident in their behavior toward the faculty librarians and in the post-test when the faculty librarians were selected as someone they would ask for help from on the same level as their peers, which was not the case in the pre-test. These results align with Detlor’s[28] findings that active learning strategies increase self-efficacy and improved relationships with the librarians. Inspired by the results of this pilot program, faculty librarians intend to expand the improved training to all new student workers. They also plan to add more active learning, and where appropriate, drawing and
illustrations, to general library instruction. The faculty librarians are also discussing how this could translate to online courses.

NOTES


ACRL, “Information Literacy Competency Standards for Higher Education.”


Bryan, 399.

ACRL, “Information Literacy Competency Standards for Higher Education.”


Bryan and Karshmer, 581.

ACRL, “Framework for Information Literacy for Higher Education.”


[28] Detlor et al., “Student Perceptions of Information Literacy Instruction.”

Bibliography


**Biographies**

Amy Harris has been working in academic libraries for over 20 years. She has presented at multiple conferences including the *International Conference on Information Literacy*, the *Association of Christian Librarians Conference*, and the *Florida Library Association*.
Conference. After earning her MLS at Indiana University, she worked in various librarian positions at Gainesville University, Southwestern Baptist Theological Seminary, Sinclair Community College, and Southeastern University. She is the Instruction and Assessment Librarian at Saint Leo University.

Dr. Doris Van Kampen-Breit has worked in academic libraries and technology for more than twenty years, has written numerous journal articles, and has presented at national and international conferences. Her research has focused on library anxiety, student learning, and other library-related topics. She is a Full Professor and University Librarian at Saint Leo University’s Daniel A. Cannon Memorial Library.

Jacalyn Bryan is an Associate Professor/Reference and Instruction Librarian at Saint Leo University and holds an M.A. (L.I.S.) from the University of South Florida and a M.A. in Dance Education from Columbia University. She has published in peer-reviewed journals including Library Review, Reference Services Review, The Journal of Academic Librarianship, and College & Research Libraries and has presented at international, national and state conferences on topics related to library instruction, information literacy, first-year experience, assessment, and critical thinking. She has received the Exemplary Learning Design Award and the Library Research Award from the Florida Library Association and the Innovation in Instruction Award from the American Library Association/Library Instruction Round Table.

Michelle Joy is an Undergraduate Online Services Librarian at Saint Leo University in Saint Leo Florida. She earned her BA in English and Creative Writing and her MA(LIS) at the University of South Florida. She has worked as a librarian at Moffitt Biomedical Library, Hillsborough Community College, and Polk State College.

Kathleen Kempa is an Associate Professor/Reference and Instruction Librarian at Southeastern University’s Steelman Library. Kempa oversees the librarians’ bibliographic
instruction activities and mentors new reference librarians. She provides bibliographic instruction for the Composition 1 and 2 students. She is the liaison librarian to the health and natural sciences colleges and provides research instruction in those disciplines. Her primary area of research over the past several years has been an exploration of the Association of College and Research Library’s Framework for Information Literacy. She has presented on the Framework at conferences and written two articles and a book chapter on aspects of the Framework. Prior to coming to academic librarianship twelve years ago, Kempa worked in public libraries in Oregon, Wisconsin, Illinois, and New York.
CHAPTER 15

Campus Wide General Education Competencies and the Visualization of Information Literacy as a Core Concept

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Introduction

Located in Central Indiana, in downtown Indianapolis, Indiana University-Purdue University Indianapolis (IUPUI) is a R2: High research activity (Master’s and PhD granting) university,[1] with an explicit focus on “advance[ing] the State of Indiana and the intellectual growth of its citizens to the highest levels nationally and internationally through research and creative activity, teaching and learning, and civic engagement.”[2] As of the 2018 census, IUPUI has a full-time equivalent (FTE) of approximately 25,489 undergraduate students, as well as 8,333 graduate or professional degree-seeking students.[3] Of IUPUI’s student body population, about 22% racially/ethnically identify as being non-white and about 4% of the population are international.[4] IUPUI also has a large number of first generation college students (29%), as well as a significant portion receiving Pell Grants (41%).[5] Almost 86.5% of the student body are native Indianans; once they complete their education many choose to stay in the state.[6]

IUPUI University Library (UL) is the main library for IUPUI and serves all of IUPUI except law, medicine, dentistry, and Herron School of Art, each of which have their own libraries.[7] Librarians at UL follow a subject liaison model and work with individual departments and schools to integrate
information literacy (IL) instruction into the disciplinary curriculum.[8] When the ACRL Framework for Information Literacy for Higher Education[9] was released, UL developed IL learning outcomes related to each frame and mapped those outcomes to the campus-wide learning outcomes.[10]

Although librarians at IUPUI have strong liaison relationships with their departments and/or schools, long-standing campus-wide learning outcomes subsumed IL under “Critical Thinking.” This led to a disconnect between librarian, campus, and faculty perceptions of IL. The disconnect made it challenging to bring attention to the interdisciplinarity and core values towards information and critical thinking of the Framework.

In 2018, IUPUI began a complete overhaul of the campus-wide learning outcomes. These new outcomes focus on the higher order cognitive skills associated with IL as articulated in the Framework, allowing for renewed discussions and engagement between librarians and faculty as well as larger campus conversations about where IL appears in the curriculum. The associated practices of the Framework become critical for describing the essentialness of IL skills in the classroom. This chapter outlines the transition to the new campus-wide learning outcomes, UL’s alignment of IL
learning outcomes to the campus-wide learning outcomes, and marketing and outreach of IL to the campus through visualizations.

Re-envisioning the General Education Learning Outcomes

With a diverse range of students, IUPUI has a diverse range of high impact learning methods, initiatives, and projects.[11] Most notably, instruction at IUPUI has moved towards embracing a model of applied theory in a real world context, also known as experiential learning.[12] The 50th anniversary of the campus, and a desire for campus-wide learning outcomes to represent the “knowledge, skills, values, and competencies” IUPUI wants students to acquire,[13] led the Division of Undergraduate Education to assemble a taskforce of various stakeholders from across campus. Their charge was to create a new set of comprehensive student learning outcomes (SLOs) to reflect the campus-wide shift in instructional momentum. The last campus-wide SLOs, known as the Principles of Undergraduate Learning (PULs), were developed in 1997. At their core, the PULs articulated broad competency areas and outcomes such as “core communication,” “critical thinking,” and “intellectual depth, breadth, and adaptiveness” (Table 1).[14] IUPUI was an early adopter in
higher education of campus-wide learning outcomes,[15] and the PULs were praised by the Association of American Colleges and Universities (AAC&U).[16] Established in 1997, the PULS went through minor revisions in 2007 and 2013. However, in terms of scope and perceived importance to the overall quality of the undergraduate students enrolled, they remained largely unchanged for twenty years.

Table 1: IUPUI Principles of Undergraduate Learning (PULs)

<table>
<thead>
<tr>
<th>PUL</th>
<th>Outcomes[17]</th>
</tr>
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</table>


| 1: Core Communication and Quantitative Skills | The ability to: express ideas and facts to others effectively in a variety of written formats; comprehend, interpret, and analyze texts; communicate orally in one-on-one and group settings; solve problems that are quantitative in nature; and make efficient use of information resources and technology for personal and professional needs. |

Core communication and quantitative skills are demonstrated by the student’s ability to:

- express ideas and facts to others effectively in a variety of formats, particularly written, oral, and visual formats;
- comprehend, interpret, and analyze ideas and facts;
- communicate effectively in a range of settings;
- identify and propose solutions for problems using quantitative tools and reasoning;
- make effective use of information resources and technology.
The ability of students to analyze complex issues and make informed decisions; synthesize information in order to arrive at reasoned conclusions; evaluate the logic, validity, and relevance of data; solve challenging problems; and use knowledge and understanding to generate and explore new questions.

The process of critical thinking begins with the ability of students to remember and understand, but it is truly realized when the student demonstrates the ability to

- apply,
- analyze,
- evaluate, and
- create

knowledge, procedures, processes, or products to discern bias, challenge assumptions, identify consequences, arrive at reasoned conclusions, generate and explore new questions, solve challenging and complex problems, and make informed decisions.
<table>
<thead>
<tr>
<th>3: Integration and Application of Knowledge</th>
<th>The ability of students to apply knowledge to enhance their personal lives; meet professional standards and competencies; and further the goals of society. Integration and application of knowledge are demonstrated by the students’ ability to</th>
</tr>
</thead>
</table>
|                                          | ● Enhance their personal lives;  
|                                          | ● Meet professional standards and competencies;  
|                                          | ● Further the goals of society; and  
|                                          | ● Work across traditional course and disciplinary boundaries. |
| 4: Intellectual Depth, Breadth, and Adaptiveness | The ability to compare and contrast approaches to knowledge in different disciplines; and adaptiveness is demonstrated by the ability to modify one’s approach to an issue or problem based on the contexts and requirements of particular situations. Intellectual depth, breadth, and adaptiveness are demonstrated by students’ ability to |
- Show substantial knowledge and understanding of at least one field of study;
- Compare and contrast approaches to knowledge in different disciplines;
- Modify one’s approach to an issue or problem based on the contexts and requirements of particular situations.

<table>
<thead>
<tr>
<th>5: Understanding Society and Culture</th>
<th>The ability to compare and contrast the range of diversity and universality in human history, societies, and ways of life; analyze and understand the interconnectedness of global and local concerns; and operate with civility in a complex social world.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Understanding society and culture is demonstrated by the students’ ability to</td>
</tr>
<tr>
<td></td>
<td>- Compare and contrast the range of diversity and universality in human history, societies, and ways of life;</td>
</tr>
<tr>
<td></td>
<td>- Analyze and understand the interconnectedness of global and local communities; and</td>
</tr>
<tr>
<td></td>
<td>- Operate with civility in a complex world.</td>
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</table>
6: Values and Ethics

The ability of students to make informed and principled choices regarding conflicting situations in their personal and public lives and to foresee the consequences of these choices; and recognize the importance of aesthetics in their personal lives and in society.

Understanding values and ethics is demonstrated by the students’ ability to

- make informed and principled choices and to foresee consequences of these choices;
- explore, understand, and cultivate an appreciation for beauty and art; and
- understand ethical principles within diverse cultural, social, environmental, and personal settings.

In concordance with the shifting demographic of students[18] as well as faculty,[19] the campus realized the need to create new SLOs that reflected the evolution of the campus. The 2018 PUL Taskforce was charged with establishing a new set of SLOs, which encompassed the RISE (research opportunities, international travel, service learning, experiential learning) initiative,[20] as well as
incorporating the co-curricular and community focused scholarship and activities of students.

Librarians at IUPUI hold tenure-track faculty status, and are voting members of campus committees and taskforces. This allowed a librarian to participate as a stakeholder on the new taskforce.

In August 2018, the taskforce presented a new set of SLOs, the Profiles of Learning for Undergraduate Students: IUPUI+ (known by the campus as the Profiles). Instead of having a six-point list of student outcomes in general education courses, the Profiles advocate for a framework of four quadrants (profiles) that outline what attributes graduates of IUPUI should have. They are:

Communicator, Innovator, Problem Solver, and Community Contributor (Figure 1).
Figure 1: Profiles of Learning for Undergraduate Success: IUPUI+. Image used with permission of the IUPUI Department of Undergraduate Education.
In the accompanying documentation to the Profiles visualization, the taskforce highlighted potential skills gained from classroom activities as well as co-curricular experiences that may be used to illustrate command of a given profile.[21] Within these Profiles, all four areas have strong connections to IL concepts as articulated in the Framework (see Table 2). As such, with the Profiles, IL as a core value has the potential to become embedded within the overarching narrative of student success at IUPUI. This marks a major change from how IL was positioned in relationship to the campus under the PULs. In the PULs, information literacy was a subcomponent of Principle 2, “Critical Thinking.” From the point of view of university administration and faculty, this meant IL was often seen, and treated, as an addendum to the emphasis on attaining and applying discipline-specific knowledge. IL was siloed and thought of as directly applicable only to academic research and not understood as a core aspect in the development of students overall intellectual and professional growth. From 1997-2018, under the PULs, IL was not perceived as being a core outcome of the SLOs for undergraduate students.

This disconnect is likely familiar to many academic libraries. Nationally, accrediting bodies often reference IL or comparable skills,[22] however, that does not always translate to IL being a core
component at the institution in program-level SLOs. More often IL is in course-level SLOs that do not always percolate up to the program-level.[23] Without a strong connection to the curriculum as a whole, IL appears sporadically and hinders development of students’ IL competencies.[24] This was the situation at IUPUI under the PULs. The creation of the Profiles led to renewed interest in bridging the gap between the library as an active partner in educating and supporting students and the lack of representation in campus outcomes.

Additionally, the Profiles maintain a degree of interdisciplinary application and focus on building the dispositional learning (“soft” skills)[25] students need for future employability and to be engaged citizens in the world. This is a significant change from the PULs in a number of ways. First, the PULs primarily reflect the student’s academic growth as they progress through their courses. There is no mention of the service or experiential learning that takes place outside of the classroom, which may afford students immediately transferable skills into the job market. Second, the Profiles place direct emphasis on a student’s ability to both interact and communicate with others across a variety of media.[26] Last, in many ways the greatest change between the PULs and the Profiles is the attempt to acknowledge and encourage individual creativity and innovation. Innovation is
adaptability to real world problems and scenarios. In our opinion, one of the greatest aspects of the Profiles is that they place value on both teamwork as well as cultural competency,[27] two areas we see as becoming more critical to the overall life and career success of individuals in our increasingly global context. Thus, the Profiles seek to help students better understand their college experiences and assist them with translating these experiences for potential employers.[28]

**Connecting the Profiles to Information Literacy**

As mentioned, the Profiles are broken down into four quadrants: Communicator, Problem Solver, Innovator, and Community Contributor. The Profiles represent an attempt to reclaim the interactive or co-curricular experience and critical thinking components of a liberal arts education that can make a marked difference in a student’s employability after college.[29] The Profiles strongly align with the Framework. Communicators “are mindful of themselves and others, listen, observe, and read thoughtfully, ask questions, evaluate information critically, create messages that demonstrate awareness of diverse audiences, and collaborate with others and across cultures to build relationships.”[30] The Profile asks students to consider and evaluate resources such as government
documents, websites, multimedia, digital collections, and scholarly articles as well as convey ideas
effectively. “Communicator” spans the Frames “Authority is Constructed and Contextual” and
“Scholarship as Conversation.” Specifically, the “Communicator” profile emphasizes the need for
students to “determine the credibility of sources,” “understand the increasingly social nature of the
information ecosystem,” as well as “contribute to the scholarly conversation at an appropriate
level.”[31] Students are tasked with assignments that encourage them to write, argue, and incorporate
a variety of credible sources displaying multiple perspectives. Not only are students expected to
engage in wider cultural discourses in which they must validate the experiences and perspectives of
those who exist outside of similar cognitive schemes, they are also asked to reflect on their own lived
experiences with respect to information, and to think about what it means to be authoritative in that
context.

The “Problem Solver” profile seeks to emphasize the close connection between the knowledge
learned in class with direct and immediate application to real world scenarios. The definition stresses
critical thinking and the collection and synthesis of information in terms of a well-defined question or
problem. The Problem Solver “works individually and with others to collect, analyze, evaluate, and
synthesize information to implement innovative solutions to challenging local and global problems.”[32] With “Problem Solver,” IL is included through the instructional focus on teaching students how to create viable research questions, and the determination and refinement of relevant information. This is related to the Frames “Research as Inquiry” and “Searching as Strategic Exploration.” Problem Solvers must “formulate questions for research,” “determine the initial scope of the task required to meet their information needs,” and “design and refine needs and search strategies as necessary, based on search results.”[33] While we associate strategic searching with methods for identifying information sources, the flipside of gathering information lays in “Research as Inquiry” integrating information appropriately into an actionable product. “Synthesizing ideas gathered from multiple sources”[34] becomes an especially valuable tool as part of the problem defining process. Across IUPUI, service learning and research, both of which are strategic instructional approaches under the RISE initiative as high impact practices, encapsulate assessment as part of the problem articulating process.[35]

“Innovator” builds on disciplinary expertise so that students’ become adept in investigating, decision-making, planning and addressing complex problems to make a difference in the community.
Innovators “use their knowledge and skills to address complex problems in order to make a
difference in the civic life of communities, and to address the world’s most pressing and enduring
issues.”[36]

The ”Innovator” profile connects to IL through in-depth disciplinary knowledge of how information
is created in a field as well as synthesizing existing information and creating new products or
knowledge from that information. Innovator aligns with the Frames “Research as Inquiry,”
“Information Creation as a Process,” and “Scholarship as Conversation.” Innovators must “use
various research methods, based on need, circumstance, and type of inquiry.”[37] The Profile draws
explicitly on skills in which students “assess the fit between a particular information product and an
information need,” while also bringing into focus how students “develop in their own creation
processes, an understanding that their choices might impact the purposes for which the information
product will be used.”[38] “Scholarship as Conversation” is also deeply tied to this Profile across
several knowledge practices. For example, “identify the contribution that particular articles, books,
and other scholarly pieces make to disciplinary knowledge,” “summarize the changes in scholarly
perspective over time on a particular topic within a specific discipline,” and “recognize that a given
scholarly work may not represent the only or even the majority perspective on the issue.”[39] To further tease out this comparison, within the humanities disciplines at IUPUI there is a deliberate approach to “Research as Inquiry” in which students are taught “to demonstrate intellectual humility (i.e., recognize their own intellectual or experiential limitations),” and “value intellectual curiosity in developing questions and learning new investigative methods.”[40] This Profile highlights the depth and breadth of disciplinary knowledge in combination with the dispositional learning outlined in the other Profiles.

Finally, “Community Contributor” seeks to highlight and build on IUPUI’s strong ties to Indianapolis[41] as well as students’ ties to campus and the broader community. Community Contributors “are socially responsible, ethically oriented, and actively engaged in the work of building strong and inclusive communities, both local and global.”[42] In the classroom, this Profile encompasses cultural understanding and awareness. Outside of the classroom, it encourages students to join and participate in campus and community events. “Community Contributor” aligns primarily with the Frame “Information Has Value.” It connects to IL in its emphasis on ethical behavior and respect for others. In the Frames, this deals with respect for others’ intellectual work and
contributions to the scholarly conversation. While most people approach this particular concept in terms of citation, its emphasis on “the commodification of their personal information and online interactions affects the information they receive and the information they produce or disseminate online.”[43] However, this Frame also has deep connections to cultural competency and IL that, given IUPUI’s active focus on diversity and local community initiatives, demands that students “understand how and why some individuals or groups of individuals maybe underrepresented or systematically marginalized within the systems that produce and disseminate information.”[44]

Table 2: IUPUI UL Learning Outcomes & Profiles of Learning for Undergraduate Success

<table>
<thead>
<tr>
<th>Information Literacy Framework Concepts</th>
<th>IUPUI Information Literacy Framework Concepts Overview</th>
<th>IUPUI UL Learning Outcomes</th>
<th>Profiles of Learning for Undergraduate Success</th>
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</thead>
<tbody>
<tr>
<td>By the time undergraduate students graduate, they will be able to:</td>
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<tr>
<td>Authority Is Constructed and Contextual</td>
<td>Information Creation as a Process</td>
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<td>----------------------------------------</td>
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<tr>
<td>Authority of information is constructed and contextual and depends on where a source comes from, information need, and how the information will be used. Authority should be viewed with an attitude of informed skepticism and an openness to new and varied perspectives and changes in schools of thought.</td>
<td>Information creation is a process where information exists in different formats, which has an impact on how it is used and shared. The underlying</td>
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<tr>
<td>- Identify authoritative information sources in any form.</td>
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<tr>
<td>- Evaluate the authority of information from various sources (e.g., peer-reviewed journals, magazines, newspapers, website, etc.).</td>
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<tr>
<td>- Acknowledge their own authority in certain contexts.</td>
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<tr>
<td>- Recognize that authority or credibility is contextual in relation to time, discipline, methodology, and other factors.</td>
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</tr>
<tr>
<td>Communicator</td>
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<tr>
<td>- Analyze own and other’s assumptions.</td>
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<td></td>
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<tr>
<td>- Evaluate relevance of contexts (e.g., historical, political, cultural) when presenting position.</td>
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<tr>
<td>- Express logical position that accounts for complex perspectives.</td>
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<td></td>
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<tr>
<td>Innovator</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- Embrace contradiction</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- Identify and adjust research question based on new information.</td>
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</tbody>
</table>
| **Information Has Value** | Information has several dimensions of value as: a commodity, a means of education, a means of influence, and a means of negotiating and understanding the world. Legal and socioeconomic interests influence information. | **Articulate traditional and emerging research processes. (e.g., literature review, statistical analysis, etc.).**  
- Distinguish between format and method of access.  
- Select sources that best meet an information need based on the audience, context, and purpose of various formats. | **Explore a topic in-depth.**  
- Manage personal and academic information online with a knowledge of the commodification of that information.  
- Recognize that intellectual property is legally and socially constructed and varies by discipline and culture.  
- Cite sources through proper attribution.  
- Identify publication practices and their related Community Contributor  
- Make informed and principled choices.  
- Exhibit respect for and preserve the dignities of others. |
<table>
<thead>
<tr>
<th>Research as Inquiry</th>
<th>Implications for how information is accessed and valued (e.g., open movement, digital divide).</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Research as Inquiry</strong></td>
<td>Research is inquiry, an iterative process that depends upon asking increasingly complex or new questions whose answers prompt additional questions or lines of inquiry in any field.</td>
</tr>
</tbody>
</table>
| **Innovator/Problem Solver** | - Formulate questions for research of an appropriate scope, based on information gaps or by reexamining existing information.  
- Select research methodology(ies) based on need, circumstance, and type of inquiry.  
- Organize information systematically (e.g., citation management software).  
- Synthesize information from multiple sources and a variety of perspectives.  
- Connect, Synthesize, or transform ideas into new ones.  
- Generate and explore new questions, solve challenging and complex problems, and make informed decisions.  
- Respond to an issue or problem based on the contexts and requirements of particular situations. |
<table>
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<tr>
<th>Scholarship as Conversation</th>
<th>Communicator/Innovator</th>
</tr>
</thead>
</table>
| Scholarship is a conversation consisting of sustained discourse within communities of scholars, researchers, or professionals, with new insights and discoveries occurring over time as a result of a variety of perspectives and interpretations. | ● Contribute to the ongoing scholarly conversation at an appropriate level.  
● Identify the contribution that information sources make within a discipline or conversation.  
● Describe the ways that communication systems privilege some perspectives and present barriers to others.  
● Summarize the changes in scholarly perspective over time on a particular topic within a specific discipline.  
● Recognize that a given scholarly work may not represent the only or even the majority perspective on the issue.  
● Evaluate and apply diverse perspectives to complex topics in the face of multiple conflicting positions.  
● Integrate communication in ways that enhance knowledge and understanding.  
● Connect to relevant experiences and academic knowledge across disciplines and perspectives at both the local and global level. |
<table>
<thead>
<tr>
<th>Searching as Strategic Exploration</th>
<th>Problem Solver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Searching is a strategic exploration encompassing inquiry, discovery, and flexibility. Searching means understanding how information is organized, identifying relevant sources, and how to access those sources.</td>
<td>- Define a research question or problem.</td>
</tr>
<tr>
<td>- Identify information need and potential sources of information (e.g., scholars, organizations, governments, industries).</td>
<td>- Use complex information from a variety of sources including personal experiences and observations to draw logical conclusions and form a decision or opinion.</td>
</tr>
<tr>
<td>- Design searches strategically, considering and selecting systems to search and evaluate results.</td>
<td>- Refine information need and search strategies based on results.</td>
</tr>
<tr>
<td>- Apply different searching language types (e.g., controlled vocabulary, keywords).</td>
<td>- Identify how information systems are organized in order to access relevant information.</td>
</tr>
</tbody>
</table>
Information Literacy Outreach and Marketing

With the adoption of the Profiles, librarians at UL saw the marketing and communication potential in the new framework. This was evident in the way the Profiles were presented to the campus. The visualization of the four quadrants of the Profiles (Figure 1) marked a sharp contrast from the textual, tabular presentation of the PULs (Table 1). UL has existing IL Learning Outcomes derived from the ACRL Framework. Librarians created a table aligning the IL Framework to the UL IL Learning Outcomes to the Profiles (Table 2). UL was one of the first units (academic or support) on campus to map departmental learning outcomes to the Profiles. The Profiles and the Frames were tied together through a crosswalk where aspects of the Frames and IL Learning Outcomes were aligned with the closest Profile match. Thanks to the robust accompanying materials the taskforce provided for the Profiles, the crosswalk was fairly easy to create. For example, the “Communicator” “evaluates information” which clearly connects to the Frame “Authority is Constructed and Contextual” and knowledge practices such as “define different types of authority.” The crosswalk contains IL jargon and is intended as a librarian-facing tool to inform discussions with faculty.
In addition to the crosswalk, subject librarians requested an outward facing graphic or resource, which could be shown to faculty and campus administration. The campus taskforce that created the visualization was eager to promote their original and gave the library permission to adapt it, provided we only added to the visualization and did not alter the original wording. The visualization uses the original Profiles graphic, overlaid with specific IL Learning Outcomes to align the Profiles with the learning outcomes but removing some of the jargon of the Framework (Figure 2). So that the graphic was as uncluttered as possible, not all outcomes were mapped. Additionally, research has found that faculty do not always understand what is meant by the phrase “information literacy” and sometimes struggle with terminology.[49] To address this, where possible, the outcomes were simplified. For example, “formulate questions for research” was rephrased to “formulate research questions.” In other cases, the jargon stood primarily because no one could think of alternate wording. For example, “articulate capabilities and constraints of various processes of information creation.” It was more important that the graphic be accessible to non-librarians than maintain strict fidelity to the Frames. Had the group been given freedom to completely modify the visualization, the original Profiles language would have been linked more explicitly to IL rather than pulled out from the Profiles under a different heading. For example, the Innovator “investigates [Profile language] the changes in
scholarly perspective over time [ACRL Frame “Scholarship as Conversation].” However, the group
would not have changed the original visualization drastically as it has been widely disseminated on
campus and is instantly recognizable. Modifying the original to remove its identifying features would
hinder, rather than help, our work trying to make connections between the Profiles and IL.

By cross walking the Profiles to the IL Learning Outcomes and creating external-facing
visualizations, UL librarians are able to articulate how deeply intertwined the library already is in the
context of campus-wide education but also identify gaps. As with most campuses, IL at IUPUI is
often viewed by faculty solely through the lens of traditional research assignments.[50] The Profiles,
through their broad conception of competencies, opens the door for librarians to discuss other ways
in which IL can be integrated into the curriculum, for example in non-research paper assignments,
service learning, and experiential learning. The IL/Profile visualization gives subject librarians the
opportunity to deepen existing school and departmental relationships as well as allowing for inroads
into disciplines where liaison relationships are not as strong.
Figure 2: Profiles of Learning for Undergraduate Success: IUPUI+ & Information Literacy. Image adapted with permission of IUPUI Department of Undergraduate Education.

Conclusion

IUPUI University Library is in the early stages of campus outreach regarding the overlap between the Profiles and IL. Initial responses to the visualization have been positive both inside the library and on campus. The visualization clearly connects core IL outcomes to the Profiles where a
tabular crosswalk is denser and takes longer to absorb. By the time the library created the IL overlay on the Profiles graphic, the original was well-known across campus and instantly recognizable so that it did not require much cognitive effort for campus stakeholders to make the IL/Profiles connection.

By minimizing jargon, librarians are able to approach faculty about the connections without that additional barrier. Because UL was one of the first units on campus to align their departmental SLOs to the Profiles, the work has been held up as an example by the campus Center for Teaching and Learning (CTL)[51] as well as receiving favorable mentions in various campus committee meetings.

We are in the fortunate position of being at the right place at the right time. The campus is ramping up marketing of the Profiles. Before Fall 2019, university administration has mandated that all school or departmental learning outcomes be mapped to the Profiles. For the 2019-20 academic year, individual classes are required to start mapping to the Profiles. Additionally, the campus is currently re-envisioning the first-year and capstone experiences, both high impact practices,[52] where faculty-librarian collaborations are strong and IL competencies are routinely taught. With our visualizations, librarians are able to reach out to departments, schools, and faculty and speak to the IL/Profiles
connection. These conversations can happen as curricular changes are made, creating more authentic connections between IL and the curriculum than if IL were added later in the process.

Through the crosswalk and visualization, subject librarians can be active partners in discussions on how best to integrate and assess the Profiles. These discussions are already happening. For example, the visualization was used in a presentation to a university-wide assessment committee to advocate for IL integration in the curriculum. The campus-wide adoption of more inclusive learning outcomes has provided a boost to IUPUI library educational services, reinvigorating and revitalizing librarian efforts to integrate IL both at the department/school level and the campus-level. Librarians have begun to reexamine their curriculum maps[53] to understand where IL could be integrated given the broader Profile outcomes. The visualizations provide an opportunity to highlight to campus administration both how ubiquitous IL is in the Profiles but also that IL still maintains a place outside the IUPUI curriculum. If these are competencies the campus values, then a deeper look at how IL is perceived and integrated into the curriculum is essential. Our visualizations make those connections clearer.
Notes

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Biographies

M. Sara Lowe is Associate Dean for Educational Services at IUPUI. She has over ten years of experience in academic libraries and previously worked at the Claremont Colleges and Drake University. She has published and presented nationally and internationally on instruction and assessment issues.

Dr. Gemmicka F. Piper is currently IUPUI’s Humanities Librarian and Copyright liaison. Her background is in 20 and 21st century African American Studies, Black Feminism, and Public Digital Humanities. She has an interest in merging visual media and creative engagement with traditional information literacy instruction, and is dedicated to ensuring equitable access to information.
CHAPTER 16

MAPPING A CULTURALLY-RESPONSIVE INFORMATION LITERACY JOURNEY FOR INTERNATIONAL STUDENTS: AN INTERDISCIPLINARY APPROACH

Yi Ding

Bessie Karras-Lazaris

California State University, Northridge

August 15, 2019

Introduction

In the fall of 2018, during the program development process for the Student Success Pathway (SSP) program at California State University Northridge (CSUN), the Online Instructional Design Librarian, Yi Ding, worked with the Academic Director of the Intensive English Program (IEP), Bessie Karras-Lazaris, to conduct research on current international
students in order to better support the students of the SSP program. CSUN’s SSP program began admitting students during the fall semester of 2019. SSP students are admitted with a lower English language proficiency score than that required for admission to the university as freshmen. The students take a combination of university classes and non-credit wrap-around support classes to begin earning General Education credits, while receiving assistance with the course content and their English language skills to ensure success in their university studies when they matriculate into a degree program. Entering such a rigorous program poses challenges for these students in terms of adapting to the expectations of information literacy skills as suggested by the Framework for Information Literacy for Higher Education (Framework). Research conducted by the authors focused on the design of digital learning resources to better serve the international students of the SSP program.

After collecting information from interviews and surveys, the authors created a persona and two experience maps informed by the Framework, culturally responsive teaching, and practices in the Teaching English to Speakers of Other Languages (TESOL), a general term used to include Teaching English as a Second Language (TESL) and Teaching English as a Foreign Language (TEFL). The authors of this chapter will discuss the research and design process used to critically situate the Framework in a global context while supporting CSUN’s goal to become “an academically attractive destination for international students.”

**Literature Review**

Many scholars and practitioners in the library and information science (LIS) field have experimented with different methods and have put forward practical suggestions to better serve international students. Allen (1993) suggests specialized instruction services;
Nataowitz (1995) points out the need to provide librarians with more training; and Brown (2000), Baron and Strout-Dapaz (2001) and Jackson (2005) analyze linguistic, cultural, and technological barriers that international adult learners experience and identify their specific needs related to academic libraries. However, in terms of research methods and impact, scholars have pointed out a gap in LIS original research studies about international students beyond surveys, and particularly ones with practical implications.

Moreover, when discussing information literacy education to international students, most scholars and practitioners in the information science field hold a deficit thinking mode and try to fix the problems instead of considering the tacit knowledge of this population or tapping into the value of the unique cultural backgrounds they bring to the classroom. As Sin points out in a statistical analysis of information source uses of international students and of information seeking challenges in everyday life, there is a dearth of studies on international students’ information behavior. Among the articles examining the research behaviors of international students, most researchers focus on the differences between these students and domestic students. For example, in a systematic review of 147 publications between 1990 and 2014 that addressed international students and academic libraries; scholars found that the most prominent topics were Library Instruction, Library Experience, and Language Issues, through which authors identify the gap of knowledge or skills of these international students.

When comparing international students to domestic students, very few studies examine these topics through the lens of the Framework. D’Angelo, B.J., et al. did examine aspects of the Framework in writing instruction, but identified the skills gap in information literacy skills and employer expectations. Scholars have advocated for focusing on educating students as consumers of information as well as creators which has resulted in more research on international students’ everyday information-seeking behavior and more support on writing and citing. However, there are very few articles that treat international
students from an intercultural perspective. Hicks and Lloyd criticize the focus of the Framework on the individual, or “solitary mastery of the existing system,” rather than the “contextual dynamics” of information literacy.

This is not the case in the TESOL field when scholars discuss strategies to educate international students. According to Weigle, “academic writing in a second language emphasizes the social aspects of writing, referring to the process of learning to write in academic contexts as one of ‘initiating ESL students into the academic discourse community’.” Writing goes beyond vocabulary and rhetoric. It requires writers to understand the requirements for writing in different disciplines. Kaplan is known for first introducing the notion of contrastive rhetoric where he identified distinct differences in the written discourse of students from different cultures. While his original thesis has been subject to criticism, it has become clear to researchers that many aspects of writing are influenced by culture. According to Grabe and Kaplan, “variation in writing in different cultures does not reflect inherent differences in thought patterns but rather ‘cultural preferences which make greater use of certain options among the linguistics possibilities’.” In addition, Leiki points out that “coherence is not an inherent quality of the text itself, but rather comes from the accuracy of the writer’s assessment of what the reader will be able to infer from the text.” Writing patterns can also be attributed to cultural differences.

The gaps in teaching international students identified above need to be considered when creating an experience map for international students. While information professionals try to better serve international students, many are often tasked with the mission to understand challenges and deficit knowledge instead of strengths and tacit knowledge unique to international students. There is also a gap of literature connecting the Framework to the service of international students. The authors of this chapter uniquely situate knowledge practices and dispositions from the Framework into the creation of digital learning objects.
informed by the user-experience design method and practices and theories in both the LIS field and the TESOL field.

An Interdisciplinary Approach to Design and Research

Method

An experience map is a flowchart of steps or actions created by designers to sketch out user interactions within products and services. A graphic representation of the journey of students resembles a user experience map that is effective to mirror and address student needs, concerns, and strategies. Just like user experience design aims to create user-centered services, an experience map based on knowledge practices and dispositions from the Framework and key findings from interviews and surveys aims to create a culturally responsive information literacy education that caters to international students.

In the user experience research field, effective surveys with both open-ended and close-ended questions accompanying interview methods are most effective to quantify the experience of target users and gather important context to design services addressing their needs. To best understand students’ research experiences, authors utilize both interviews and surveys to investigate students’ research and educational experiences, especially their relevant tacit knowledge and cultural values. A survey was used to collect anonymous feedback on students’ awareness and familiarity of library resources in their home country, research and writing practices in the U.S., and preferred ways of getting research help. Individual interviews were used by the researchers to understand perceptions of different steps of the research process and habits of students’ information literacy skills. Approval has been obtained from the Institutional Review Board to conduct both the interviews and the surveys (Appendix 1).
Subjects and Sample Sizes

Potential users or adopters of the experience maps include Intensive English Program (IEP) students who meet the university’s admission requirements for first-time freshman but have not yet achieved the English language proficiency score for acceptance to the university, instructors teaching international students, and librarians potentially providing information literacy instruction for international students.

In both the scientific and user experience research field, the ideal sample size for the development of an experience map varies. Seaman summarized the concept of the sample size in his article “The Right Number of User Interviews” by referring to Greg Guest and colleagues who stated that “from an ethnographic study that they created 97% of their research codes [were] within 12 interviews and 94% in the first 6,” and the user experience research guru Nielsen Norman suggested five usability test subjects for each user population. The study conducted for this chapter consisted of 16 individual interviews with students, four interviews with instructors and librarians, and 29 survey responses.

The students interviewed were new to the American university system and research methodology used in the United States. The majority of students were from Asian countries, aligning with a portion of the projected student demographic of the SSP program. Of the students interviewed in the IEP, some students plan to matriculate to a US university once they fulfill the English language requirement, and others plan to return home to complete their degree programs after completing their “Semester at CSUN,” a study-abroad experience in the US. Thirteen students were interviewed ranging from those who were presently enrolled in an introductory research paper class, to those who were in the university bridge program and had written one or two research papers. The research experiences of interviewees varied so the authors were able to understand the diverse
experiences international students bring to the program and as such design user-centered digital learning resources, such as, a persona and experience maps.

Understanding Research Results from the LIS and TESOL Perspectives

The survey focused on the frequency of library use of students in their home countries prior to coming to the US in comparison to the frequency while studying in the US. Of the students surveyed, 55.1% did not use the library in their home countries. Of the resources used by students, the most popular were book checkout and online tutorials with 50-55% of students using both or either. The third most popular resource was reference consultation with 33.33% use. The least popular resource, which most students indicated they were unfamiliar with, was interlibrary loan with only 16.67% use. When asked about citation styles, MLA vs. APA, 100% of the students surveyed were familiar with MLA with only 10% familiar with APA. However, fewer than 30% reported being familiar with MLA, APA or Chicago style before starting their studies in the US.

Similarly, most of the interviewees had no experience writing any type of research paper in high school. Even for those who had completed one or two years of college education in their home country, most of them had not written a research paper. Two students who had majored in English and one student who had majored in social sciences had done research, but only for a short essay. One student explicitly said he was "not familiar with an English language research paper" at all. Most interviewees had used the library in their home country to study, but few of them had used it to do research, borrow books, or ask questions. It is therefore not surprising that research seemed to be a linear process for these students, rather than an open-ended exploration as suggested by “Research as Inquiry” in the Framework, as best demonstrated in a student’s comment that "the researcher needs to know what s/he is researching".
There is also a dichotomic view towards the credibility of scholarly and popular sources. Some typical quotes are “I believe all articles are reliable because they are academic,” and "A book is the most reliable… it's the best source…everything is true...the Internet sometimes has lies and gives fake information… but it is easier.” Also, most interviewees shared their difficulty coming up with counterarguments, especially given the serious censorship of dissenting ideas in the home countries of some IEP students, including China and Saudi Arabia. All of these suggest a need for instructors to discuss with students different types of credible sources and authority, and assist them with finding tools to help them identify sources as suggested by knowledge practices and dispositions of “Authority is Constructed and Contextual” in the Framework.

When asked what would be most helpful to the students during the research process, most indicated that attending a library session, asking a librarian, or using the library consultation resource to learn how to find and cite credible sources would be useful. However, due to the common students’ perception of research as a linear process, it is recommended that instructors and librarians pay particular attention to knowledge practices and dispositions of “Research as Inquiry,” by demystifying and teaching help seeking in every step of the research process.

Revisiting the Framework to Create Persona and Experience Map

While providing high level principles and guiding concepts of information literacy education, the Framework does not address the cognitive, emotional, and cultural struggles specific to international students when using, evaluating, and creating information in American colleges. Developed in the United States higher education system, the Framework does not align with the values of the educational system familiar to international students. Information
literacy skills encompass fundamental academic skills necessary to work within different disciplines. Nevertheless, this set of academic skills is not decontextualized. Quite the opposite, these skills can only be taught to different students by making sure the contextual knowledge, such as a basic expectation of higher education, is understood.

For example, international students transitioning from educational systems that value authority and set knowledge more than independent thinking and scholarly conversation may get lost in the higher education expectations of the United States. Also, one critical challenge that academic librarians should bear in mind when providing information literacy instruction services for international students is, as demonstrated by the interviews, students' unfamiliarity with presenting opposing viewpoints or asking questions. It is especially important for academic librarians to emphasize college learning as a collaborative conversation and as a critical inquiry for international students when teaching information literacy skills, as suggested by the “Information Creation as Process,” “Research as Inquiry,” and “Scholarship as Conversation,” in the Framework.

Based on concerns expressed in the interviews, a persona was created to clarify the goals, pain points, information needs and current processes experienced by students, which guided the creation of the experience maps. Findings from the surveys and interviews also align with many of the evidence-based TESOL suggestions IEP provided to CSUN’s English faculty, who teach English Stretch Courses to students who have not been placed into Freshman English classes. Students enrolled in these courses are often international students. Therefore, faculty are faced with the challenge of how to work with these students effectively. A persona was created based on both interview and survey findings and those evidence-based practices in the TESOL field, ranging from students’ educational background, to research, to writing, to study habits and frustrations, and to how culture may influence their research and writing (Figure 1). While the persona was used to summarize research findings and these TESOL practices in a structured and straightforward way, its
function is twofold. First, it has been used by the Online Instructional Design Librarian to design the digital learning resources, the experience maps and embedded Canvas modules for international students. Second, it could be used by the IEP program and the Library to help instructors and librarians better understand IEP students, prioritize class activities, and assess learning outcomes based on the Framework. The persona, a stock photo with a generic Chinese name to show representative traits of an IEP student, provides descriptions and guidelines for instructors, which are analyses of the descriptions categorized by sections of the Framework. The descriptions and takeaways are not designed for any specific student. Instead, they are based directly from on interviews and knowledge practices from the Framework.
Based on the persona, an experience map with steps about the research process and how-to resources for students were created (Figure 2). No frames from the Framework are explicitly mentioned in the student-facing experience map. Instead, the visualization of the research journey itself along with examples and tips to achieve the skills discussed in different frames map a culturally-responsive research journey. For example, the cyclical process and the question mark indicating research as an open-ended exploration indicates knowledge practices informed by “Research as Inquiry” (Figure 3). All modules linked to the
different steps start with a Why section, which was originally designed for all CSUN students but modified to cater to the needs of IEP students (Figure 4).

To better incorporate the Framework into the application and teaching of the above student-facing experience map, an accompanied instructor-facing experience map has been created with explicit sections of frames (Figure 5). Each frame is linked to a flowchart detailing knowledge practices and dispositions (Figure 6). Drawing from interviews with librarians, faculty, and administrators from the IEP who work closely with international students, both experience maps incorporate key strategies to teach international students different steps of the information seeking and creation process into the culturally responsive map. The maps could be introduced to library colleagues and faculty from other departments to understand student needs, as well as to be used in instructional sessions to teach students to better understand authority, information creation, research, scholarship, and search.
Figure 2. Ding, Yi. Screenshot of Research Journey Map embedded in Canvas (Oct.31, 2019). https://canvas.csun.edu/courses/75794
Feel free to go back and forth on different steps!

The research journey is rarely a linear process.

Instead, be prepared to go back and forth in any step.

Still not sure what to do? Your professor and librarians are always there to help you!

Figure 3. Ding, Yi. Screenshot of pop-up window for the question mark button in Research Journey Map (Oct.31, 2019). https://www.thinglink.com/scene/1232785261444726790
Why this Module?

What is this module about?
In any activity of creating/remixing content at college, be it a paper, a Canvas post, or a PowerPoint presentation, giving credit is important. Understanding how to give credit to other people’s ideas will also prevent you from many more serious consequences due to intentional or unintentional plagiarism in your professional life in the future. Complete this module to be an expert in citing information.

After doing this module, you will be able to:
- Elaborate the reasons for proper citation and the consequences of plagiarism.
- Identify three ways of using other people’s ideas.
- Comprehend when and how to cite and what tools to use to check for plagiarism.

Now let’s get started!

- Reasons to Cite and Avoid Plagiarism
- Examples of Citing Property
- Tools to Check for Plagiarism
- Quiz to Check Comprehension

Figure 4. CSUN Oviatt Library. Screenshot of the introduction page of avoiding plagiarism Canvas module (Oct.31, 2019). https://canvas.csun.edu/courses/75794/pages/reasons-to-cite-and-avoid-plagiarism-3?module_item_id=2117707
Research Journey Map (for IEP instructors)

Figure 5. Ding, Yi. Screenshot of Research Journey Map for IEP Instructors (Oct.31, 2019).
Conclusion

Information literacy skills entail not only the abilities to discover, evaluate, apply, and share information, but also knowledge and academic skills required by a western academic setting, which are exactly what international students need to improve in order to succeed in an academic setting. Taking an interdisciplinary approach to understand and visualize the Framework, the persona and experience maps will enable both TESOL instructors and academic librarians to better understand the needs of international students.

This chapter discusses the rationale and the process of applying the design method and an interdisciplinary approach in integrating threshold concepts, knowledge practices, and dispositions from the Framework to visualize students’ research journeys as well as
strategies involved during the process. These can serve as examples for library professionals to map the information seeking and creation process of diverse learners to support teaching and learning. The persona is useful for both the development and assessment of the SSP program at CSUN and for discussions of international students' needs in general. A template of the persona is available in Appendix 2 for wider use beyond the SSP program at CSUN.

Appendix 1: IRB Materials

Email solicitation for student subjects:

Dear students,

You have been invited to participate in a survey being conducted by Bessie Karras-Lazaris (bessie.lazaris@csun.edu), Academic Director of the Intensive English and Student Success Pathways Programs; and Yi Ding (yi.ding@csun.edu), CSUN Faculty Librarian, to help improve the process by which international students learn to do research in U.S. universities. This information will be used to create an interactive, culturally-responsive experience map that you and other international students will be able to use.
We thank you for your participation in our study. You are not only helping us understand your own research journey, but you are also assisting us in improving the process for other international students who may be faced with similar challenges when working on research assignments.

Bessie Karras-Lazaris

Academic Director,

Intensive English Program

Student Success Pathways

International Programs and Partnerships

Phone: (818) 677-5938

https://tsengcollege.csun.edu/programs/IPP

Script for the verbal solicitation for student subjects:

Hello. My name is Bessie Karras-Lazaris, Academic Director of CSUN’s Intensive English and Student Success Pathways Programs and this is Yi Ding, Faculty Librarian of the Oviatt library.
We have invited you here today to ask you a few questions about some of the issues you may have encountered while doing research for some of your assignments.

The purpose of this research is to identify some of the challenges international students may encounter while studying in the United States and conducting research for assignments.

Once we gather the information regarding this topic, we will create an interactive map that you and other international students can use to make their job of doing research more effective.

Your personal information will not be mentioned in our study. Any information you provide will remain anonymous.

You can ask us any questions before we begin, and you are welcome to ask any additional questions during and after the survey.

Thank you again for participating in our study.
Appendix 2:

Persona Template
Notes


Bibliography


**Biographies**

Yi Ding is a faculty librarian specializing in instructional design and open educational resources at California State University, Northridge (CSUN). She has over five years of serving international students in academic consultation, information literacy instruction, design, and cultural events. She is on the Advisory Board of the CSUN China Institute and has presented at several local, national, and
international library and educational conferences including Comparative and International Education Symposium, QS Asia Pacific Professional Leaders in Education Conference and Exhibition, and Library and Information Technology Association Forum on her research and design work to better serve international students.

Bessie Karras-Lazaris is the Academic Director of the Intensive English and Student Success Pathway Programs at CSUN. She has 20 years of university administrative experience having held previous positions as Associate Director and Director of Academic Programs and Student Life. In the areas of both administration and teaching, she has worked at universities and colleges in California and Ohio and an international school in Greece. At CSUN, she serves on the Upper Division Writing Exam (UDWPE), multilingual writers, linguistics, and sustainability/ environmental humanities committees and is on the Phi Beta Delta board. She was also awarded the CSUN Presidential Award for continuous outstanding service. She has given numerous presentations and has held leadership roles in professional organizations such as TESOL, CATESOL and English USA, and she has contributed to and authored various publications, including four EFL textbooks.
CHAPTER 17

Mind the Gap (In Your Knowledge):

Using the Framework Transit Map

Laura M. Bernhardt (David L. Rice Library, University of Southern Indiana)
Becca Neel (David L. Rice Library, University of Southern Indiana)

Introduction

“If you’re going underground, why do you need to bother about geography? It’s not so important. Connections are the thing.”[1]

When Henry Charles (“Harry”) Beck set to work creating his revolutionary map design for the London transit system, he arrived at a vitally important insight: While the underground rail system
did connect different geographical points, the experience of travel in that system was not centered
around above-ground landmarks and geographical features.[2] His London tube map – especially if it
is understood as a system diagram rather than a geographical map – is for this reason uniquely useful
for representing the actual experience of navigating public transit, which is determined by the
relations and connections among stations or stops rather than the actual landscape. Beck’s insight
about connections and the user experience of navigating them also makes a tube map-style
representation especially useful for diagramming conceptual rather than spatial domains (arguably
more effective, in fact, than a number of other alternatives).[3]

One of the obstacles facing academic librarians when it comes to promoting information literacy
instruction across the curriculum is achieving faculty buy-in. We need tools for teaching non-library
faculty to understand what information literacy instruction entails and how to fully integrate it into
their syllabi and assignments. This is especially important for librarians working in curricular
contexts in which one-shot instruction is the institutional norm. Under those conditions, it is the
course instructor rather than the librarian who is primarily responsible for reinforcing and assessing
information literacy outcomes for the course, which makes it vital for librarians to find a way to
make the best use of faculty partnerships for instruction and assessment purposes. In order to promote our end -- information literacy -- we must sell the Framework to an audience not necessarily familiar with its aims or receptive to our instructional practices and priorities, who must then put the Framework to use. Librarians must find ways to help non-library faculty to navigate the conceptual domain of information literacy.

At the University of Southern Indiana, we have tried to address these obstacles by developing a simple interactive tool – the Framework Objective Generator (FrOG) -- for outcome generation and course design brainstorming using the Framework for Information Literacy for Higher Education.[4] The tool is structured around relatively simple questions mapped to more complex threshold concepts in the context of a guide through the beginnings of the backward design process. In order to help our users make the most of this tool – and to allow librarians to sell it more effectively – we then created a visualization, the Beck-inspired Framework Transit Map, to represent the concepts at work and the ways in which they are related to each other.

For our purpose, a transit map or diagram reveals and contextualizes the relationships among the knowledge practices through which the threshold concepts that constitute the frames are reached.
Instead of viewing each frame in isolation or as a static list of practices and concepts, the transit map design encourages the user to consider each frame dynamically, in terms of the connections and relations among those concepts and practices. This makes it easier (we hope!) for users to visualize the complex network of skills and competencies involved in the development of information literacy skills. Ideally, the Framework Transit Map serves both as a helpful aid to understanding the Framework and as an illustrative process guide for applying it, designed to be attractive to faculty who would otherwise be reluctant to take on what they perceive as the extra work of creating and assessing information literacy outcomes.

Connections, as Beck understood so well, are the thing.

The Problem

Before we speak in more detail about the Framework Transit Map and how it can be used to help faculty find their way in the conceptual system described by the Framework, it’s important to establish a clear understanding of the problem that the tool the Map represents is meant to solve.
What specific obstacles stand in the way of faculty buy-in for teaching with the Framework? What difficulties do librarians face as faculty partners in the work of promoting, teaching, and assessing student learning with the Framework?

One useful way to describe the most common obstacles to librarian/faculty collaboration for the purpose of information literacy instruction is to break them down into two categories: *structural* challenges and *conceptual* challenges. Structural challenges tend to arise from what Larry Hardesty called “faculty culture”: faculty may be reluctant to engage with library instruction (including information literacy instruction) because of a set of features deriving from the conditions of their training and employment.[5] These conditions include:

- a relative lack of formal training as teachers (often combined with an institutionally reinforced preference for research work)
- extensive non-instructional demands on faculty time
- disciplinary hyper-specialization that makes it difficult to take on concepts and practices from other knowledge domains
• a need to defend disciplinary boundaries as a part of asserting and defending intellectual freedom

• for the adjuncts responsible for most introductory-level instruction, a tenuous employment situation that leaves little freedom and less time to devote to course design and assessment.[6]

Conceptual challenges tend to arise from the disciplinary peculiarities of how librarians and non-library faculty perform and communicate about their work; librarians and faculty in other disciplines find that they don’t “speak the same language” about student learning and information literacy, and therefore may encounter difficulty in developing a common understanding of the nature of the work needed for information literacy instruction.[7]

There is an additional level of complication in both the structural and conceptual puzzles when we take into account the fact that librarians themselves may not always be comfortable with using the Framework. As Christine Bombaro pointed out in her essay objecting to the implementation of the Framework, librarians may be in a variety of different positions relative to their teaching needs and priorities, and there is in fact no universal consensus on how the Framework is to be interpreted or
applied even in a library context.[8] Of particular interest in Bombaro’s essay is a distinction she observes between what she calls “philosopher” librarians (faculty librarians with additional advanced degrees, often teaching full-term courses) and “practical” librarians (primarily teaching one-shots).[9] The former, in her analysis, tend to favor the Framework approach, and understand it quite differently from the latter, who seem to prefer the more rigorously described Standards and find the Framework vague or jargon-laden to the point of uselessness.[10] If her observations of the different librarian experiences of the Framework are correct, then it’s quite likely that the communication problem that affects teaching faculty and librarians on the subject of using the Framework also divides librarians themselves, largely because of the conditions of their education and employment.

Taken together, structural and conceptual challenges frequently result in an unwillingness on the part of non-library faculty to take on the work of information literacy instruction, even when they are willing to treat librarians as partners in the educational enterprise, because of an understandable reluctance to exert unrewarding effort toward the achievement of a poorly understood end. This requires librarians to seek out ways to clarify the goal and core concepts of information literacy instruction and (if possible) simplify and make meaningful the faculty effort required to adopt
information literacy objectives and to assess student learning relative to these objectives. It also
occasions resistance among librarians uncomfortable with the Framework, which may undermine the
effectiveness of efforts to use the Framework for library instruction and to communicate about what
teaching with the Framework can accomplish.

*The Tool*

At the University of Southern Indiana, we decided to address these challenges by designing a
tool for faculty to use to develop course and assignment objectives aligned with the Framework. This
tool, the Framework Objective Generator (FrOG), uses an integration of the LibGuides and Guide on
the Side platforms to walk users through a set of steps for creating measurable course or assignment
objectives. The tool begins the process by presenting a list of simple questions (e.g. “Who’s the
expert, and why?”) that students acquiring information literacy skills should be asking throughout the
course or assignment. Each clickable question routes the user to a LibGuide page that presents
relevant Framework knowledge practices (hereafter KPs) that have been rewritten as measurable
objectives, along with the AAC&U Information Literacy VALUE Rubric outcomes (Outcomes) that map to the listed KPs.[11] A Guide on the Side then walks the user through the process of choosing and adapting these KPs to specific course needs. The Guide proceeds according to an abbreviated backward design process, assisting users as they develop their own course or assignment objectives and think through how to apply and assess them.

We decided to map the Framework to the AAC&U Outcomes because we wanted the tool to provide our faculty with a streamlined assessment experience. Several campus departments and assessment bodies across the University of Southern Indiana currently use some version or other of the AAC&U Outcomes for program or course assessment, so we chose to map the Framework to learning objective language that was already widely accepted (or at least recognized) among local academic units. As we set out to map the six frames to the five AAC&U Outcomes, our first task was to break down the nebulous, one-to-many relationships between the frames and Outcomes, and highlight the exact points of interaction between the two conceptual systems (see Fig. 1 for a side-by-side list of frames and Outcomes).
<table>
<thead>
<tr>
<th>Frames</th>
<th>AAC&amp;U Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authority is Constructed and Contextual</td>
<td>Determine the Extent of Information Needed (Determine)</td>
</tr>
<tr>
<td>(Authority)</td>
<td></td>
</tr>
<tr>
<td>Information Creation as a Process</td>
<td>Access Needed Information (Access)</td>
</tr>
<tr>
<td>(Process)</td>
<td></td>
</tr>
<tr>
<td>Information has Value (Value)</td>
<td>Critically Evaluate Information and its Sources (Critical)</td>
</tr>
<tr>
<td>Research as Inquiry (Inquiry)</td>
<td>Use Information Effectively to Accomish a Specific Purpose (Effective)</td>
</tr>
<tr>
<td>(Conversation)</td>
<td></td>
</tr>
<tr>
<td>Searching as Strategic Exploration</td>
<td>Access and Use Information Legally and Ethically (Ethical)</td>
</tr>
<tr>
<td>(Exploration)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. List of ACRL Frames and AAC&U Outcomes prior to mapping. Abbreviations indicated with parentheses. Note that we have chosen to use a slightly different convention for abbreviating the titles of the individual frames from other chapters in this book; our one-word abbreviations are drawn from the in-document header bookmarks of the HTML version of the
Framework document, primarily to facilitate clarity and ease of recognition in our Framework visualization.

For example, on the surface, it is intuitively obvious that the concepts and abilities addressed in the Authority frame affect two Outcomes: the ability to critically evaluate information and its sources (Critical), and the ability to access and use information ethically and legally (Ethical). Likewise, mastery of the Critical Outcome appears quite naturally to incorporate aspects of all six frames. But, for the purpose of tool navigability (and user sanity), how *exactly* does understanding that authority is constructed and contextual affect the critical evaluation of information? And for the sake of educational assessment, how can we measure that understanding or effect?

The knowledge practices associated with each of the six frames provide the answers to both of those questions. The KPs, as descriptions of learner practices, successfully break down the overwhelmingly broad concepts represented by each frame into distinct, observable microconcepts. Moreover, the majority of the KPs begin (either by accident or by design) with terms that appear in Bloom’s
Taxonomy of Measurable Verbs,[12] which facilitates measurability in an educational setting. At the start of the mapping process, we reworded any KPs that either lacked a Bloom verb or were excessively verbose in order to provide a consistently and efficiently useful term set. Each KP was then assigned a number, indicating the frame to which it belongs and the order in which it appears in the list of KPs in the original Framework document. For example, we assigned the first KP listed under the first frame (Authority) the number 1.1, the second knowledge practice listed under Authority is KP 1.2, and so on -- all the way to the final KP under Exploration: 6.8 (see Appendix for the complete list of reworded KPs).

We then mapped each KP to a relevant AAC&U Outcome. Within this structure each KP corresponds to only one frame and only one Outcome. Each frame maps to various Outcomes via its associated KPs and each Outcome maps to various frames by way of those same KPs. This Framework-to-AAC&U Outcome map provides the fundamental structure of the tool, while the reworked KPs provide adaptable learning objective language for users. The question prompts in the FrOG’s Guide on the Side then extend beyond the ACRL and AAC&U conceptual models and simple objective generation by prompting users to consider how objectives could be reworded for
specific course use, how students will demonstrate mastery of the stated objective, what task mastery
looks like, and how the instructor will measure or assess student work relative to the stated objectives
for the course or assignment.

*The Framework Transit Map*

The tool described above is a complex amalgam of processes, platforms, and conceptual framework
mappings on the back end -- effectively a Choose Your Own Information Literacy Adventure. In
order to facilitate easier use on the front end, we set to work to develop a reasonably straightforward
graphic representation of the overlapping intersections of information literacy skills in the
Framework, which would provide FrOG users with a mechanism for visualizing how the objectives
generated using the tool relate to the other essential practices of an information-literate individual.
We wanted a way to give FrOG users the big picture and also to integrate relevant smaller sections of
that picture into different areas of the tool so as to provide users with a sort of “You are here” sign to
orient them in their work. This led us to build the Framework Transit Map, modeled on Harry Beck’s classic design.

The Framework Transit Map consists of six transit lines, each one corresponding to a frame. The frames intersect at five transfer points, which correspond to the five AAC&U Outcomes. The smaller, non-transfer stops on each of the frame lines represent frame-specific KPs that constitute the necessary skills an individual must develop in order to demonstrate mastery of the AAC&U outcomes. Take, for example, the Access Needed Information (Access) transfer point. On the map, there are three lines (frames) that pass through that point: Value, Conversation, and Exploration. The KPs characteristic of users skilled in gaining access to needed information -- such as “6.4: Choose search tools that are appropriate to information needs and search strategies,” or “3.5: Recognize issues of access or lack of access to information sources” (see Fig. 1) -- are located on their associated frame lines prior to (i.e. approaching) the Access transit point, signifying their role in the development of information access practices relevant to each frame.
Figure 2. The Framework Transit Map.

The KP-to-AAC&U Outcome arrangement on the frame lines assumes that travel on the map moves from right to left, although this doesn’t mean that users can’t backtrack if necessary. Likewise, the AAC&U Outcome transfer points are arranged on the map in a manner that is meant to represent the realistic, functional progression and interdependence, from right to left, toward each Outcome. In order to access needed information, for instance, it is first necessary to determine the extent of information needed. Likewise, information must be critically evaluated before it can be used.
effectively to achieve a purpose. The diagram thus pictures not only the basic concepts attached to
each frame, but also the information literacy work or process in action by way of the connections
among knowledge practices on the way to Outcomes.

This emphasis on process is precisely the reason why we chose to represent the frames as lines rather
than transit points or stops on the Map, even though it might have been visually cleaner or simpler to
do otherwise. The frames are, by design, dynamic rather than static in form, a noteworthy change
from the language of the Standards that the Framework replaced; the “framework” language was
deliberately chosen “because [the Framework] 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.”[13] The Framework is meant to be used to create and
conceptualize local processes and outcomes, rather than imposing a fixed set of external
requirements on local decision makers.

Treating the AAC&U Outcomes as transit points, then, reflects a local outcome decision process
supported by the Framework’s core concepts, which in turn clarifies the work done when a user
considers the relevant KPs in order to generate objective language with the FrOG. Because the
Framework Transit Map is a process or system diagram rather than an outcome list, the transit points allow users to see the connections among stages in or elements of the information discovery and usage process, complete with the implicit understanding that one may “travel” back and forth along lines as needed (give or take the original right-to-left drive through the overall set of relations represented).

**Using the Framework Transit Map**

What, then, might it look like to use the FrOG and the Framework Transit Map to create course or assignment objectives? How might the Framework Transit Map help FrOG users think about the questions they ought to choose and the implications of the answers to those questions? To begin with, let’s consider a brief illustration of the user’s experience of the FrOG tool (Fig. 3).
Figure 3. A representation of the user’s path through the FrOG, set alongside the back-end mapping and a simple representation of the user interface.

When users begin the FrOG process, the first thing the tool shows them is a brief depiction of the Frames. The FrOG instructs users to select a Theme (where each theme is directly connected to a specific Frame), and clicking on a given Theme presents users with a set of relatively straightforward
questions, presented as queries a student is expected to pose and answer; this part of the process is meant to focus the user’s efforts on thinking about how to express their desired course or assignment outcomes (see Fig. 4 for an example of what this looks like). These questions link users to a collection of Knowledge Practices (each of which is associated with one or more of the AAC&U outcomes), which are phrased and presented as candidates for use as course or assignment objectives.

Figure 4. A snapshot of the FrOG’s initial question menu, which themes as main
blocks that open to reveal questions that link out to appropriate frames and KPs.

A Guide on the Side module, using a set of open-ended prompts, leads users through the process of using those suggested model objectives to form or select objectives of their own. The Guide on the Side then uses additional open-ended prompts to direct users in the initial development of assessment-worthy activities and reasonable measures of success relative to the achievement of the objectives they’ve selected or created. When users complete the FrOG, the system emails them a document that represents their path through the process and includes their answers to the objective and assignment/assessment creation prompts. The Framework Transit Map is included in full at the beginning of the process to illustrate the bigger picture, and close-up details of the map are included at relevant points along the way as a part of the selection activity, so that users have the opportunity to use the Map to consider how the Outcomes and KPs are related to each other as a part of shaping their own thinking.

As a more detailed case study, let’s walk through the more specific example of a recently developed introductory graduate course at the University of Southern Indiana. The LBST 501 Information Literacy and Research course was designed and taught by USI campus librarians acting as adjunct
instructors in the College of Liberal Arts. The librarians developed the course to meet Quality Matters (QM) course review standards and a set of departmentally prescribed course objectives derived from the AAC&U Information Literacy VALUE Rubric Outcomes. With given course objectives as a point of departure, the librarians began the process of backward course design – from course to unit objectives, then from unit objectives to activities – by dividing the course into five units: an introductory unit and four additional units each devoted to one of the course objectives (for a brief outline of the course in its current form, see Fig. 5). The process was time- and labor-intensive, primarily because the librarians had to work out course objective/outcome alignments for the units and assignments from scratch.

<table>
<thead>
<tr>
<th>Unit Number</th>
<th>Unit Theme</th>
<th>KPs Adapted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Definitions of information and IL</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>Critically evaluate information and its sources (Critical)</td>
<td>1.1, 1.2, 2.1, 2.6</td>
</tr>
<tr>
<td>3</td>
<td>Determine the extent of information needed (Determine)</td>
<td>4.1, 4.2, 4.3, 6.1, 6.5</td>
</tr>
<tr>
<td>4</td>
<td>Access Needed Information (Access)</td>
<td>3.5, 5.3, 5.5, 6.2, 6.6, 6.7</td>
</tr>
<tr>
<td>5</td>
<td>Effectively use info to accomplish specific purpose &amp; Access and use info ethically and legally (Effective, Ethical)</td>
<td>3.1, 3.2, 3.3, 5.1</td>
</tr>
</tbody>
</table>

5. LBST 501 course outline. AAC&U Outcomes serve as themes for units 2-5.

Building the same course using the FrOG simplifies the design process by letting the tool itself handle the complex outcome mapping and term selection work behind the scenes, thus freeing the user to think more deeply about the implications of instructional choices made with the FrOG’s guidance. As illustrated and above (Fig. 3), the process begins with a list of simple questions found via the Theme/Frame links on the FrOG front page, organized into broad categories. For any given course, several questions might conceivably fit the scope of intended instructional content. Because LBST 501 is an introductory research course that requires critical source evaluation at the course
outcome level, questions like “Who is the authority, and why?”, “Does format indicate quality of content?”, or “Which sources should I use?” are a natural fit for the work course designers are most likely to have in mind.

Assuming the designers choose to go the “Who is the authority...?” route, the FrOG would lead them through questions specifically encouraging the derivation of local objectives from specifically Authority-related KPs. The starting point in the FrOG for the designers of this particular course is that students whose instructors want them to understand matters of authority appropriately should be asking themselves the following questions: “Who’s the expert, and why?” and “Is information format indicative of quality?”[16] Those two questions route the FrOG user to two distinct outcome pages associated with the Authority and Process frame KPs, mapped to the appropriate AAC&U Outcomes, particularly the Critical Outcome. Figure 6 depicts the Authority KPs leading up to mastery of the Critical Outcome; Figure 7 depicts the Process KPs necessary for Critical mastery. The designer can then adapt KP-modeled language in order to begin generating specific course and assignment objectives that meet instructional needs.
On the Framework Transit Map, the choice to consider authority and source credibility suggests initial attention to the Authority line (Fig. 7), which crosses or meets the Critical and Ethical transit points. As it happens, while all frame lines route through Critical, only one other line crosses or meets both Critical and Ethical: Conversation. Credibility judgments are thereby located in the context of the discourse in which they are most meaningful. Comparing the KPs of these two lines to each other reveals a set of clues suggesting ways to use Conversation KPs to develop assignment objectives that might ultimately inform Authority KPs to support Authority-relevant outcomes.
Figure 6. Close-up view of the section of the Framework Transit Map detailing the knowledge practices on the Authority line leading to Critical mastery.

Examining the impact of format on credibility turns the user to the Process line (Fig. 7), which passes through the Determine, Critical, and Effective points; interestingly, so does the Inquiry line, which
requires evaluating materials for gaps or errors on its approach to Critical, alongside Process KPs addressing the effects of context and format on the perceived quality of information. Perceived errors or shortcomings in information coverage may actually be conditioned on the form or context in which that information is presented (a fairly common difficulty facing interdisciplinary work), which suggests as useful angle of approach to creating assignments that require students to work out how to make good judgements about coverage in a variety of forms and contexts.
Conclusion

As our brief look at LBST 501 suggests, while neither the Map nor the FrOG require users to do any particular thing, they do offer the possibility of solutions to the structural and conceptual challenges facing both librarians and non-library faculty with regard to information literacy instruction. The FrOG primarily addresses structural problems by more clearly connecting course and assignment creation to assessment, which has the potential to vastly simplify the work a faculty member has to do. Its non-prescriptive nature – encouraging local users to make local decisions about appropriate objectives and helping them to find the language to do so – might prove particularly attractive to faculty members who would otherwise object to having their course structures or content decisions dictated by someone else’s priorities. The Framework Transit Map, especially when used in conjunction with the FrOG, addresses the conceptual challenges facing librarians seeking buy-in both inside and outside of the library for information literacy instruction by offering a way to envision the
Framework that emphasizes processes and connections rather than listed outcomes, thus clarifying
the business of applying the Framework for all concerned.

Appendix

The Frames and their associated Knowledge Practices, reworded so that each KP contains an
actionable verb consistent with Bloom’s Taxonomy.
Authority

1.1 Define different types of authority

1.2 Determine credibility of sources based on tools or indicators

1.3 Recognize disciplinary constructs of authority, as well as the possibility of challenging these norms

1.4 Recognize that authoritative content may be packaged formally or informally and may include sources of all media types

1.5 Recognize responsibilities of developing one’s own authority, including seeking accuracy and reliability, respecting intellectual property, and participating in communities of practice

1.6 Demonstrate and awareness of the increasingly social nature of the information ecosystem where authorities actively connect with each other and sources develop over time

Information Creation

2.1 Articulate capabilities and constraints of information developed through various processes

2.2 Assess the fit between an information product’s creation process and a particular information need
2.3 Articulate traditional and emerging processes of information creation and dissemination in a particular discipline

2.4 Recognize that information may be perceived differently based on format

2.5 Recognize implications of information formats that contain static or dynamic information

2.6 Compare the value of information products in varying contexts

2.7 Transfer knowledge of capabilities and constraints to new types of information products

2.8 Develop, during the creation process, an understanding that author choices impact future uses and interpretations of an information product

**Information Has Value**

3.1 Integrate original ideas of others into one's own work, giving credit through proper attribution and citation

3.2 Demonstrate an understanding that intellectual property is a legal and social construct that varies by culture

3.3 Articulate purpose and distinguishing characteristics of copyright, fair use, OA, and the public domain

3.4 Consider how and why some individuals or groups may be underrepresented or systematically marginalized within systems that produce and disseminate information
3.5 Recognize issues of access or lack of access to information sources

3.6 Decide where and how one's information is published

3.7 Discuss how commodification of personal information and online interactions affects the information one receives, produces, or disseminates online

3.8 Act in full awareness of issues related to privacy and the commodification of personal information in online environments

Research

4.1 Formulate questions for research based on information gaps or reexamination of existing, possibly conflicting information

4.2 Determine appropriate scope of investigation

4.3 Focus scope of investigation by breaking complex research questions into simple ones

4.4 Use various research methods based on need, circumstance, and type of inquiry

4.5 Analyze gathered information and assess for gaps or weaknesses

4.6 Organize information in meaningful ways

4.7 Produce works that synthesize ideas gathered from multiple sources
4.8 Formulate reasonable conclusions based on the analysis and interpretation of information

**Scholarship**

5.1 Cite the contributing work of others in one's own information production

5.2 Support the scholarly conversation by contributing at the appropriate level

5.3 Identify barriers to entering scholarly conversation via various venues

5.4 Critically evaluate contributions made by others in participatory information environments

5.5 Identify the contribution that particular scholarly works make to disciplinary knowledge

5.6 Summarize the changes in scholarly perspective over time on a particular topic within a specific discipline

5.7 Recognize that a given scholarly work may not represent the only or majority perspective on an issue

**Searching**

6.1 Determine the initial scope of the task required to meet information needs

6.2 Identify interested parties who might produce information about topic, then determine how to access that information
6.3 Employ divergent and convergent thinking when searching

6.4 Choose search tools that are appropriate to info needs and search strategies

6.5 Design and refine needs and search strategies as necessary based on search results

6.6 Demonstrate an understanding of how information systems are organized by accessing relevant information

6.7 Use different types of searching language appropriately

6.8 Evaluate searching processes and results effectively
Notes


interesting example of a use of this style of representation to map a purely conceptual domain, see David G. Stern, “The University of Iowa Tractatus Map,” *Nordic Wittgenstein Review*, December 16, 2016, 203–20.


[14] The course was built and taught by Andrea Wright (the Assistant Director and Head of Public Services at the David L. Rice Library, USI) and chapter co-author Becca Neel (Online Learning Librarian).

[16] We make this assumption here because it is in fact what the designers of the course assumed. There is no necessary reason other than such a local choice for this to be the case, and different users are free to start from their own assumptions.

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Biographies

Laura Bernhardt (former philosophy professor, current librarian, occasional musician, perpetual nerd) is a Reference and Instruction Librarian in the David L. Rice Library at the University of Southern Indiana. In addition to her scholarly interest in all things InfoLit, she also studies ethics and the philosophy of information.

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